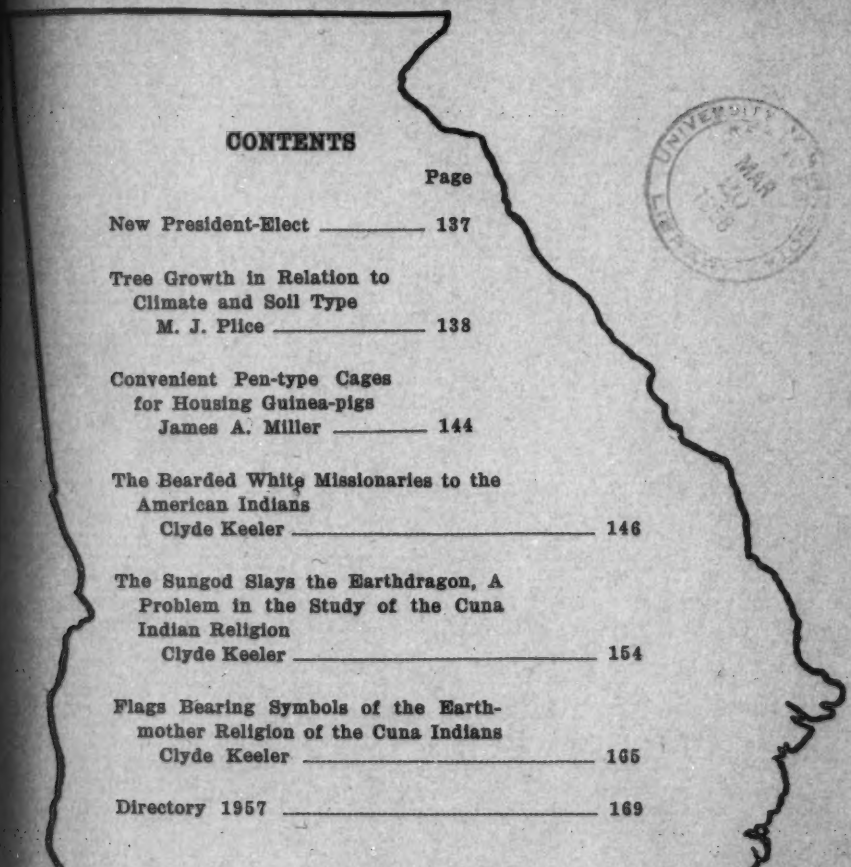
106
B995

BULLETIN *of*
The GEORGIA ACADEMY *of* SCIENCE

Vol. XV SEPTEMBER, 1957 Number 4



UNIVERSITY OF GEORGIA
MAR
1958
LIBRARY

CONTENTS

Page

New President-Elect 137

Tree Growth in Relation to Climate and Soil Type
M. J. Plice 138

Convenient Pen-type Cages for Housing Guinea-pigs
James A. Miller 144

The Bearded White Missionaries to the American Indians
Clyde Keeler 146

The Sungod Slays the Earthdragon, A Problem in the Study of the Cuna Indian Religion
Clyde Keeler 154

Flags Bearing Symbols of the Earth-mother Religion of the Cuna Indians
Clyde Keeler 165

Directory 1957 169

BULLETIN OF GEORGIA ACADEMY OF SCIENCE

EXECUTIVE COUNCIL

OFFICERS

President, Wm. H. Jones — Secretary, Marion Clark
Vice-President, Netta Gray — Treasurer, J. G. Lester
President-Elect, T. W. Kethley — Historian, W. B. Baker
Retiring President, Wilbur H. Duncan

MEMBERS-AT-LARGE

E. A. Bailey — Nelson Severinghaus — Lewis Lipps

SECTION AND AFFILIATE REPRESENTATIVES

Netta Gray, I — E. H. Dixon, IV
W. J. Frierson, II — Hudson Jost, V
Romeo Martin, III — Richard Hocking, VI
Katherine Hertzka, VII
Emily Dexter, Georgia Psychological Association
A. S. Furcron, Georgia Mineral Society
Lucille Burnette, Director Georgia Junior Academy of Science

SECTION CHAIRMEN

I. R. B. Platt — IV. Dewey Cooper
II. Gene Roberts — V. Mary Schumpert
III. W. H. Grant — VI. Leon Hardy
VII. Louise Stakely

W. B. Redmond, Editor

A. S. Furcron, W. H. Jones, Florene M. Young — Assistant Editors

THE BULLETIN of the GEORGIA ACADEMY OF SCIENCE is published four times each year, in January, April, June and September and is sent without charge to all members of the Academy.

Articles to be published in the Bulletin should be sent to the Editor, Box 534, Emory University, Georgia. Reprints of articles can be furnished when ordered before publication.

NEW PRESIDENT-ELECT

During the summer Dr. M. H. Goodwin, recently elected to the office of President-Elect, was transferred to a laboratory of U.S.P.H.S. in Arizona. The Academy regrets his resignation from office but sends its good wishes with Dr. Goodwin as he enters into this new work.

To fill the vacancy created by Dr. Goodwin's move, the Council at the Fall Meeting voted to appoint Mr. Tom Kethley of the Georgia Institute of Technology to the office of President-Elect and he has accepted this appointment. Mr. Kethley is a member of the staff of the Engineering Experiment Station and is well known to Academy members through his service on a number of committees

TREE GROWTH IN RELATION TO CLIMATE AND SOIL TYPE

M. J. Plice
Atlanta, Georgia

It is quite well known in biology that different species of seaweeds have widely different ash contents even though they grow side by side in sea water of remarkably uniform chemical composition. Such species variation in amount and kind of chemical elements taken up by these plants is said to be due to "selective absorption." It is not so well known whether land plants growing in soils of widely diverse origin and chemical composition have the ability to absorb mineral elements from the soil selectively and specifically.

In order to learn something more about this the writer has made a protracted study of the ash elements in more than three hundred species of field plants and in the leaves of more than four hundred species of trees growing in widely different kinds of soil in most of the States of the Union. At the same time a detailed study of the chemical composition of the soils in which these plants and trees grew was made. A study of the results thus obtained shows that field plants, particularly crop plants and shallow rooted plants, in general, can and do vary considerably in the amounts and kinds of mineral elements which they take up from the soil from place to place in any year. This is believed to be due mainly to varying cultural and fertilizing practices used from place to place. However, it was seen that the ash make-up of tree leaves seems to follow a species pattern very closely so that the ash pattern of the leaves of a sugar maple tree, for example, growing in Vermont is very close to that of the leaves of a sugar maple tree growing in Georgia, Iowa, Montana, or elsewhere.

Ash Content of Tree Leaves

The amount of ash elements in tree leaves varies with the tree species. The largest amount of leaf ash encountered in any tree species growing in the United States is about 24 per cent and the smallest about three per cent. The leaf-ash contents of most species range between seven and 14 per cent. The amount of ash in the leaves of any particular tree may vary slightly from year to year according to the amount of soil moisture available in the root zone. In general, the greater the total annual precipitation, the greater the amount of ash in the leaves. This does not always hold true, for distribution of rainfall over the seasons also plays a part. Further, it is quite well known by foresters that there is a "hold-over" effect on tree growth from one season to another; that is, a very dry year or a very wet year will affect tree growth the following year, no matter whether that year is normal weatherwise or not; the drier the soil the greater the effect. This effect can be anticipated, or kept-track-of, by careful, timely, and proper determination of root-zone moisture. The amount of "available" moisture in the root zone is

the most influential factor of all and anything that causes this to vary also causes variation in leaf-ash content and in annual wood increment. Individual mineral elements in leaf ash, such as calcium, magnesium, silica, et cetera, may vary more from year to year, percentage-wise, than total ash percentages. The degree of constancy of ash in tree leaves in wet versus dry years is fairly well regulated by the total leaf area formed, respectively, in these years by trees.

Leaf Ash and Tree Growth

Just as the ash in a tree leaf varies with available soil moisture so varies the annual increment of wood, or width of annual ring. The factor of heredity sometimes enters here and this will be discussed briefly at the conclusion. The widest annual rings occur in years of most abundant soil moisture as does the highest amount of leaf ash. The correlation of these factors is strong. It cannot be said, however, that a certain amount of precipitation will produce a definite amount of wood increment; other, somewhat conflicting, factors prevent this.

There is an interesting relationship between the amount of available nitrogen in the root zone and mineral, or ash, elements contained in tree leaves. In years of much available soil moisture the *percentage* of nitrogen is decreased in the leaves. However, the *total amount* of nitrogen in the leaves runs fairly constant from year to year. This brings up the interesting question of the relative importance of nitrogen and minerals. Nitrogen seems to influence leaf ash and annual increment similarly as would an application of extra water to the root zone in a dry year. It may do this by increasing the efficiency of moisture use by a tree. The chemical composition of the soil has, seemingly, little importance; but the physical condition of the soil does have. For example, heavy soils have, generally, more available nitrogen and minerals, but not moisture, than do light soils. And tree growth on light soils is generally superior to that on heavy soils. Root ramification in light soils is much more extensive than in heavy soils and this aids the tree in its search for moisture and nutrient materials. It has been found in the present study that if physical conditions are at all favorable to tree growth, a tree of any species will maintain quite a consistent ash pattern in its leaves whether it grows in soils of igneous, sedimentary, or metamorphic origin, or whether the soil is either of the mor or mull variety.

Examples of Leaf Ash and Tree Growth

In order to show typical leaf ash consumption and annual increment in relation to the chemical composition of the soil. two tree species, each, from southeastern Oklahoma and from DeKalb County, Georgia, are compared in table 1. The tree species are hackberry, or sugarberry (Celtis laevigata), in high-ash tree, and loblolly pine (Pinus taeda), a low-ash tree. In all tables the various *mineral* ele-

ments are expressed in per cent of their oxides and the width of the annual rings in millimeters.

In table 2 is shown the chemical composition of the Oklahoma and Georgia soils in which the trees were growing. In each instance the hackberry tree and the pine tree were growing close to each other so that one composite sample of soil in each case was sufficient for analysis. Twelve soil cores were taken under each pair of trees. Each core was three inches in diameter and thirty inches deep. Each set of cores was dried, pulverized, homogenized, and compounded and representative samples of the soils were analyzed.

The Oklahoma soil was a forest soil, derived from Carboniferous sandy shale and was unclassified, officially, as to type, or "species." The Georgia soil is classified as Cecil sandy clay loam and is derived from metamorphosed granite. It is at once evident that these two soils are widely different, chemically.

Variation of Leaf Ash Elements in Successive Years

Table 3 shows how leaf-ash elements and the widths of the annual growth rings vary in successive years in a single tree. Here are shown the data of eight successive years, 1938 through 1945, for a bald cypress (Taxodium distichum) tree, approximately 30 inches DBH and growing readily in true Prairie country in north central Oklahoma. For comparison, the analysis is given at the bottom of the table of a composite sample of bald cypress leaves collected in 1952 in four widely different regions from large trees growing in southern Louisiana, southeastern Illinois, eastern North Carolina, and the Corkscrew Swamp in Florida. The width of the annual ring given is the average of the four trees for the year involved.

It is believed that the above comparison is an interesting one, particularly since the Oklahoma cypress is really an exotic. The prairie site is as different from the swamp sites as the zenith is from the nadir. In the above table it can be seen that in the data for the Oklahoma tree there is good correlation between the ash figures and the annual ring widths for the different years. Although annual precipitation is not shown, there is strong correlation between this and the ash and growth figures. These relationships are not shown for the swamp cypresses since rainfall data was not obtainable.

Soil Moisture Variation in a Single Site

In table 4 is shown an example of the manner in which soil moisture variation in a single site can influence leaf-ash content and annual ring width. Involved were three poplar trees (Populus deltoides) growing on one side of a ravine in Prairie country. They were even-aged (37 years) and the progeny of a single parent. Tree No. 1 grew near the top of the ravine; tree No. 2 near the middle of the slope; and tree No. 3 near the bottom of the ravine. They were growing just far enough apart not to touch each other. The soil was slip, or talus, material and quite uniform in chemical and

physical properties—very similar to the soil in which the bald cypress was growing. The main difference in the situation was an increasing amount of soil moisture from the top to the bottom of the ravine, the bottom averaging about double that at the top. The diameters of the trees from top to bottom were 10.4; 14.6; and 19.8 inches, respectively, and the heights varied in about the same proportion.

Effect of Heredity

Tree growth is influenced by heredity as well as by environment. But, as yet, it is difficult to distinguish and isolate hereditary from environmental effects so that they may be analyzed and measured separately.

The attention of the writer was once called to a small grove of live oak trees growing on an old rice paddy not far from Charleston, South Carolina. There were 33 trees in the grove and all but three of them were quite uniform in diameter—approximately 25 inches. These three trees were considerably larger than the others and ranged from 55 to 57 inches DBH. They were not "clumped" together but were well dispersed with the others. Study revealed that the trees were all of the same age, 59 years, and the owner of the property stated that they were all the progeny of an old seed tree which had been cut 20 years previously and sawed into meat-cutting blocks.

The soil in the grove was studied in detail chemically, physically, and for moisture relationships. No significant differences in any of these properties were found; in fact, they were remarkably uniform. The ash content of the leaves of the larger trees were significantly, but not proportionately, greater than those of the smaller trees.

The compelling conclusion reached was that the increased growth of the larger trees and the larger amounts of ash elements in their leaves were due to the effect of heredity. Perhaps the larger trees were endowed with a greater efficiency in their uptake and utilization of moisture and nutrient elements than the smaller ones. The exact mechanism of this increase in metabolic efficiency was not indicated. However, a detailed study of the biochemical make-up of one of the large trees and of one of the smaller trees indicated that the differential growth qualities might have their seat in the tree roots; they seemed to be intricately related to the buffer system there. This system was acidic in the case of both the large and small trees but was significantly more strongly acid in the roots of the larger trees. Base exchange properties were also more pronounced in the roots of the large trees.

Note: All tree-leaf samples used in this study consisted of representative fresh, mature, and unweathered material.

Table 1

Chemical composition of tree leaves. Trees No. 1 and No. 2 are Oklahoma and Georgia, respectively, loblolly pine. Trees No. 3 and No. 4 are Oklahoma and Georgia, respectively, hackberry. Annual ring-millimeters. Chemical elements in percentage of their oxides.

Tree No.	PH	N	Ash	Si	Fe	Al	Ti	P	Mn	Ca	Mg	K	Na	S	Ann. Ring
1	3.8	.62	3.22	1.38	.02	.07	.17	.07	.03	.31	.24	.21	.07	.03	5.1
2	3.9	.66	3.29	1.43	.03	.05	.21	.06	.02	.35	.27	.29	.09	.05	5.3
3	6.2	.99	21.96	10.01	.07	.33	.29	.21	.03	7.05	.56	.97	.12	.33	4.6
4	6.4	1.04	22.47	10.31	.11	.37	.33	.22	.02	7.30	.65	1.05	.17	.35	4.7

Table 2

Chemical composition of soils in which the trees shown in Table 1 were growing. Soil No. 1 is Oklahoma soil; soil No. 2 is Georgia soil. O.M. = organic matter. Chemical elements in percentage of their oxides.

Soil No.	PH	O.M.	N	Si	Fe	Al	Ti	P	Mn	Ca	Mg	K	Na	S	
1	4.6	.68	.02	94.81	1.11	2.80	.24	.01	.01	.06	.07	.15	.01	.01	
2	5.9	4.32	.11	76.45	4.41	11.72	.88	.24	.03	.03	.35	1.10	.27	.08	

Table 3

Table 3

Variation in leaf-ash elements and width of annual rings in succesive years. Bald cypress trees in Prairie country. Bottom line is composite of samples from four cypress swamp areas. Chemical elements in percentage of their oxides.

Year	PH	N	Ash	Si	Fe	Al	Ti	P	Mn	Ca	Mg	K	Na	S	Ann. Ring
1938	4.3	.83	6.41	.70	.13	.24	.15	.14	.04	1.99	.36	.63	.07	.15	4.1
1939	4.3	.81	6.60	.75	.05	.24	.11	.19	.01	2.32	.41	.61	.07	.17	4.6
1940	4.5	.75	7.42	.74	.11	.31	.14	.13	.01	2.40	.46	.69	.09	.16	5.0
1941	4.5	.70	7.50	.75	.15	.28	.17	.17	.03	2.46	.45	.56	.09	.14	5.9
1942	4.6	.70	7.65	.49	.07	.21	.15	.13	.01	2.72	.37	.52	.09	.16	8.3
1943	4.5	.72	7.40	.49	.05	.40	.16	.09	.07	2.41	.43	.97	.06	.21	5.3
1944	4.3	.78	6.71	.47	.05	.30	.12	.15	.05	2.87	.82	.93	.07	.14	4.5
1945	4.3	.75	6.51	.49	.06	.29	.15	.11	.05	2.45	.33	.91	.08	.17	4.3
1952	4.4	.75	6.87	.58	.07	.31	.18	.13	.03	2.37	.50	.72	.06	.15	5.9

Table 4

Leaf-ash content and width of annual rings of three poplar trees growing on slope with variation in soil moisture content. Chemical elements in percentage of their oxides.

Tree	PH	N	Ash	Si	Fe	Al	Ti	P	Mn	Ca	Mg	K	Na	S	Ann. Ring
Top	5.1	.81	14.90	4.30	.05	.19	.17	.20	.01	3.26	1.45	1.56	.09	1.87	3.4
Middle	5.1	.79	15.36	4.51	.06	.25	.21	.21	.01	3.59	1.41	1.66	.11	2.05	6.9
Bottom	5.2	.76	16.30	4.83	.07	.27	.24	.21	.01	3.70	1.21	1.85	.12	2.61	9.7

CONVENIENT PEN-TYPE CAGES FOR HOUSING GUINEA-PIGS*

JAMES A. MILLER, JR., *Emory University*

To obtain the maximum return from an animal colony, the cages should be both healthful for the animals and convenient for the caretaker. Since guinea-pigs apparently do not reproduce as well on wire as in solid bottom cages, pens of the type described below were constructed and have been in use for the past year. In these quarters the colony has prospered. Since the caretaker reports that the pens are convenient to service and easy to clean, it was thought that a brief description of one of the units might prove of value to others interested in establishing or maintaining a guinea-pig colony.

As seen in figure 1, each pen consists of three parts—a stainless steel tray, a rectangular fence that fits inside the tray, and a strip of stainless steel which closes the open end of the tray. The open end of the tray is to facilitate scraping with a small hand hoe during cleaning. The 4½-inch high sides of the tray are to prevent the animals from kicking the litter out of the pens. To provide adequate space for a breeding colony of approximately a dozen adult animals, the trays are 28″ x 28″. A removable partition made of welded wire fencing (not shown) is provided in case smaller groups are desired.

FIGURE 1. *A dis-assembled three-piece pen for guinea-pigs. The pen is made of 1″ mesh welded wire fencing, the tray and end gate of stainless steel sheet metal. When assembled the end gate is slipped under the fencing and the weight of the fencing holds it securely.*

The fence is 14 inches high and is constructed of one inch mesh welded fencing. The small sized mesh is necessary to prevent the escape of young animals. It also provides convenient supports for automatic feeders and waterers.

Figure 2 shows three such pens on a single unit rack. The rack is constructed of 1¼-inch square steel tubing with tracks for the trays made out of angle-irons welded to the frame. The lowest pen contains a dozen adult guinea-pigs with their young, two automatic pellet feeders and a jar of water. The middle and lowest pens have been pulled out slightly to illustrate their accessibility for servicing. The top unit has been made 2½ inches wider than the other two in order to utilize the maximum space on the top of the rack. This increases the capacity of this pen by three or four additional animals.

The racks are raised six inches off the floor to facilitiate cleaning and there is 20 inches of clearance between shelves to permit

*Aided by a grant from the National Institutes of Health.

easy access to the pens. At the National Institute for Medical Research in London cage racks for small animals are supported from the ceiling. This arrangement offers the distinct advantage of providing a completely unobstructed floor for sweeping or mopping. If ceiling supports are available the pens may be supported from above without difficulty.

FIGURE 2. *A single unit rack with three pens. Note that the upper pen, resting on top of the rack is 2½" wider than the others. The lower cages have been pulled forward slightly to illustrate their accessibility. In the lowest cage are two automatic feeders, a jar for water, a dozen adult guinea-pigs and their offspring.*

The tubing used for the racks has sufficient strength to support double units of six pens each (not shown) on four legs. The middle tracks of these double racks are constructed of inverted T-iron instead of angle-iron.

Before placing the animals in the trays they are filled to a depth of approximately three-fourths of an inch with peat moss to absorb water. On this the litter consisting of hay or straw is added. As the litter is eaten or trampled underfoot more hay is added each day. This regime provides odor-free pens for approximately two weeks, except when overcrowded. Under these conditions more frequent changes may be necessary. Sterilization of the pens is easy since the parts are completely separate and since there are no inaccessible corners.

The pens and racks are made by the University Shop at Emory University, at a price which compares favorably with less well-constructed cages which are in addition less convenient than those described above.

THE BEARDED, WHITE MISSIONARIES TO THE AMERICAN INDIANS

CLYDE KEELER
Georgia State College for Women, Milledgeville

One of the great puzzles in the study of Indian religions is that of the bearded, white missionaries who came from the east bearing the symbol of the cross long before the time of Columbus. The conquistadores believed them to be Christians of the early centuries, and in particular they favored the explanation that St. Thomas, after preaching in India, sailed on to America.

Some have believed that they were Europeans, possibly Vikings, or Irish or Welch, but no record remains of their actual provenance in the Old World. This origin seems within the realm of reason, because there is evidence that America was visited, colonized and traded with at various times during at least 5,000 years. Of the earlier contacts little in the way of writings exist, but art pieces, religious symbols, architecture, identical words, stories and traditions all proclaim a common, ancient, world-wide culture. Some have felt that such close contacts between continents as must be assumed from this theory were impossible because of the lack of seaworthy boats, but we know that the ancient Egyptians and possibly the Sumerians had sailing vessels larger than those of Columbus.

Furthermore, there are a number of records showing that many pre-Columbian expeditions to America did take place.

It is set down in the *Icelandic Landnamabok* (*Colonial Record Book*) that Ari the Viking sailed west from Iceland and visited Hvitramanna Land or the Colony of Greater Ireland in A.D. 982. In 1010 Thorfin Karlsefni met two Indian boys in Massachusetts who told him that to the west lived people who wore white garments, shouted loudly and carried rods with white cloths attached to them. Presumably these were Christians in religious procession at the Irish Colony of Hvitramanna Land.

There are a number of Irish sagas referring to voyages to the west. One important story is that of King Madoc, and another is that of St. Brandan.

King Madov of North Wales sailed for the west in 1170 for the purpose of colonization. The saga has him returning several years later for additional colonists. He set sail once more never to be heard of again.

St. Brandan lived in the sixth century, and originally the stories of his voyage may have been told about others but finally were crystallized about him. At any rate, he was said to have sailed west, ran into thick banks of fog and found bird and bird's egg islands in the western sea. Such encounters could refer to such places as Percé Rock and Bonaventure Island off the coast of Quebec.

Twenty years before the first voyage of Columbus two Italian brothers mapped the coast about the mouth of the St. Lawrence River, and as late as 1480 a vessel put out from Bristol to seek the

lands across the western sea. It will also be remembered that before undertaking his voyage in 1492 Columbus visited Iceland where there were records of western explorations, and possibly he conversed with mariners who actually had been in America.

The anthropological evidences are also highly suggestive that Europeans had colonized America and had hybridized with tribes of Asiatic origin.

Light colored individuals were not uncommon among the Dakotas, Menomini and Zuñi although their features were definitely Asiatic. The White Indians of Venezuela are well known from accounts of the conquistadores and a few of this group of Indians are still alive today. The Tuscaroras are thought to show an ancient admixture with Caucasians.

That the now-extinct Mandans probably represented a European colony turned native is a natural conclusion to draw from the independent eyewitness descriptions of these people by Catlin, Mitchell, and la Verandrye.

Columbus commented on his discovery of Negroes on the northern coast of South America, and recent studies have shown that various African tribes possessed maize in about the year 800 A.D., suggesting east-west traffic, possibly by the Phoenicians. Another evidence that transoceanic trade had flourished between America and other continents is contained in the *Annals of the Chinese Empire for 499 A.D.* in which the Buddhist priest Hoei-Shin describes his visit to South America on a merchant vessel. Besides these evidences there is a mass of other suggestive facts, too tedious and tenuous to be considered here.

Two slate slabs bearing the Gangetic form of Sumerian linear script have been discovered in Bolivia and Peru. Their inscriptions are almost identical. The Verrills published a translation. Some authorities contend that these inscriptions are forgeries, but one salient fact seems to rule out the falsification theory. These inscribed stones were found before anybody had learned to decipher Sumerian script! The Verrills also collected a series of Sumerian words identical or similar to Inca words and having identical or similar meanings. Such facts demand a belief in frequent trade and colonization contacts.

Paul Herrmann writes that there appears to have been six bearded white founders of religion among the American Indians, in Mexico Quetzalcoatl, in Yucatan Zamno, in Peru Viracocha, in Brazil and Paraguay Zume, among the Tupi the god Tupan, and in Colombia Bochica. However, I believe that these stories have enough in common that most or all of them may refer to the same most ancient personage, be he god, demi-god or human hero. In fact, the Cuna Indians have a corresponding cultural hero whose life story, I am convinced, may be able to shed some light upon these mysteries.

Quetzalcoatl (Kukulkan of the Mayas) was born of a virgin, and thus, according to some Indians, he was a holy hermaphrodite born without the sin of sexual intercourse—born only of the placenta. Quetzalcoatl was a white man, fair haired, bearded and finely built.

His wife (and probably his mother) was the Earthmother, the Queen of Serpents. This distinguished leader with his followers from beyond the eastern sea came first to Tollan, and finding it already too heavily populated to make a living, moved on to Cholula where they were well received. He brought maize. After living and teaching arts, culture and religion in Cholula for twenty years he returned by the way he had come taking with him four virtuous youths from the city, but sending them back from Coatbacoalco, a province on the seashore one hundred and fifty leagues away.

FIGURE 1. *Pottery head of a bearded man, probably Kukulkan, from St. Lorenzo, Mexico. After Verrill and Verrill.*

The youths returned home with his message that in the future white men with long beards like his would come from the east to be the Lords of Mexico. See figure 1. The sign of the cross was common in the religion of Quetzalcoatl. The Verrills believed Quetzalcoatl to be Sargon, the son of Menes.

When Lt. Pedro de Candia of Pizarro's advance guard entered the Inca seaport of Tumbez, the people fell at his feet just as the Aztecs did to Cortez when they called him Quetzalcoatl. But the Tumbezians called Lt. de Candia "Viracocha," the Holy Man from the Sea. See figures 2 and 3.

Viracocha, at the time of creation, when there was still no light, came up with his men from the depths of Lake Titicaca (Birth canal of the Earthmother), settled on the sacred island, and carried out an extensive creation program including plants, sun, moon, animals, and man. His servants finally proved disloyal, so Viracocha in his anger changed them to stone and disappeared in Lake Titicaca. Later he came up from the lake once more. (Ipeorgun, the Cuna cultural hero also returned to the womb of the Earthmother). This is presumably the original gestation of mankind in the Earthmother's womb, spoken of in the religion of so many American Indian tribes. It would make Viracocha a parallel of Adam or Noah.

Viracocha was supposed to have founded Tiahuanaco on Lake Titicaca and also Cuzco. In the holy city of Pachacamac he was praised as "Kon-Tiki the Eternal, Creator and Ruler of the Earth."

At Cuzco Viracocha was eventually defeated by Cari, leader of

FIGURE 2. *Wara Wilke. Really a local animal manifestations of Wiracocha.*

the Coquimbotal. Viracocha's white men were slain and sacrificed to the gods while the white god, himself, escaped with a few followers. On the western seashore he preached a final sermon to his world and his creatures (an attachment for animals characteristic of Enkidu, Adam, Noah, Ipeorkun), and prophesied many things to come. Then he spread his cloak on the sea, stepped upon it with his disciples and sailed away. The subjects of the Incas were awaiting his return just as those of Montezuma looked for the second coming of Quetzalcoatl.

FIGURE 3. *Water jar showing Wiracocha, the bearded god. Chan Chan, Peru. After Verrill and Verrill.*

Viracocha was revered as high above the Sun, "The Everlasting Lord, symbol of the world and its eternal first cause, master and ruler. He is the Sun of Suns. He is the Creator of the World." So says an ancient Inca prayer. Viracocha was bearded.

Most of these accounts of the founders of American Indian religion—and there are a number of them—describe them as white skinned and bearded. They came from the east.

Possibly the story of Bochica will help us with the meaning of these bearded, white missionaries who came from the east, taught techniques. culture and religion and then departed promising to come again.

Bochica was the great teacher of the Chibcha Indians of Colombia. "Long, long ago," said the tribal learned one, the Chibchas turned away from God who saw that for this they must be punished. He flooded the Valley of Bogota with two mountain torrents. A few

survivors besought God's mercy upon a mountain top, but the great majority of the people perished. The Bochica appeared on a rainbow and caused the flood to recede.

This story suggests that the Chibcha looked on Bochica as their Noah or Jehovah at the time of the Great Flood which was actually at the time of the creation of plants, animals and man. It will be remembered that the Rainbow of Promise in Flood stories is the Protective Placenta of the Earthmother in many Indian versions. And because the placental dragon is so often killed by the Sungod in the Earthmother's allegorical parturition scene, possibly Bochica is actually the Sungod.

The Cuna cultural hero, Ipeorkunkunkilel, the Golden One, descended from Heaven, landing on the bank of the Tuile River on the Sacred Mountain, Tarcarcuna. Ipeorkun taught about the meaning of the sacred mountain Tarcarcuna with its lake, from which all rivers flowed (Parturition scene of the Earthmother). He sent Tata Makearkwenatha to Darien to tell of his prophesy that a series of Neles would descend from Heaven, often as newborn children to be nursed and raised by virgins, that they might teach the Cunas more about God and his will for the lives of men. He instituted the puberty ceremony for girls, prescribed noserings, brought maize, taught the use of uchu mimmi idols, housebuilding, ejecting devils. He had much magic, could control wild beasts, raise the dead, calm the hurricane. He was a friend of the beasts as was Viracocha and Adam. After this great mists covered the earth, as in the days of the Garden of Eden, save that these mists were white, red, blue and yellow, — colors of deep religious significance.

Ipeorkun told of the ancient struggle between the Gods and their Children of Light with the Evil ones and their Children of Darkness. He taught crafts and ceremonies, while wandering from village to village. He went to Nektup and thence to Pukhuarkana and there, as a man in his fifties, he died. He requested that a great, golden cross be set up over his grave. Thereafter, Tata Make, his disciple, continued to preach Ipeorkun's holy way of life.

On earth Ipeorkun had the qualities of a high priest, as did the Adam of Genesis. The Cunas do not refer to him as a god.

In ancient cultures one always has the difficulty of distinguishing between original gods, demi-gods, cultural heroes and deified kings who often take on the attributes of the original gods.

One notes in these bearded, white missionary stories that the religious ones ordinarily come from the east. When messengers from Heaven in the Sun of Skyworld come to earth they step onto the land or sail their boat onto the water about the edge of the flat earth as the Sun comes close to the earth's edge at sunrise. Eventually they appear on the Mount of Gestation of the Earthmother. Could these missionaries actually be celestial messengers, or the gods themselves taking on the form of human flesh and coming to dwell among men, rather than Vikings, Welsh, Irish, Mesopotamians or Christian Saints? I think so.

But what about the cross symbol that Quetzalcoatl bore on the

shoulder of his garment? What about the great, golden cross that the Cuna Ipeorkun requested to be erected over his grave at Pukhuarkana? It is certain that these crosses were not symbols of Christ's crucifixion or else something of Christ's passion, death and resurrection would have been given in the teachings of the bearded missionaries. If they were really Sungods or Sons of the Sungod, even the presence of the cross would be explained. Geor, the Sungod who slew the Dragon, was bearded and had the cross as a symbol. See figure 4. So had other Sungods. Their crosses represented lines to the four cardinal points of the compass or else lines from the earth to the equinoxes and solstices in the annual cycle of the sun.

FIGURE 4. *First Sumerian King Dar (Thor, St. George) from a seal-cylinder, probably about 2,000 B. C. The king seems to be bearded. He appears to be planting or uprooting a Celtic Sun-Cross standard. His eponomous he-goat prances before him, and his eagle spreads its wings above the Tree of Life. From Waddell's* Makers of Civilization, Race and History *after Ward.*

Ipeorkun and Quetzalcoatl brought maize. But maize originally grew in Heaven.

Why a bearded white god among generally beardless people? It may be said that the Chinese have this concept and so had the Mesopotamians in the form of Sin the Moon-god, the father of the Sungod.

Thus, I contend that the six bearded, white missionaries may all have been derived from one ancient story, taking on variations as the story was adapted to each tribal civilization. Such an origin would be logical if American Indian civilization spread north in a number of waves from Tiahuanaco, as Chief Shup-She and others believe to have been the case.

Supposedly about 935 A.D. Manko Capak the First Inca with his men, several generations after the Great Flood, slipped onto the sacred island in Lake Titicaca and when the aborigines came to worship, they emerged from the sacred cave on the island saying that Manko Capak was descended from the Sun and that they were looking for the Son of God. The Peruvians insisted upon and glorified this cave of gestation much as Christians have woven allegory about the manger scene which was sometimes represented as in a grotto. This Inca cave story might be passed off as insignificant were it not for the fact that the world emergence stories, very widespread among American Indians, call for a cave (the Earthmother's uterus), a lake (the Earthmother's vagina) and a mountain (the Earthmother's Mons veneris).

By hiding in the cave and then emerging at the proper time Manko Capak was merely carrying out the same ritual of spiritual rebirth from the Earthmother still enacted by various rulers of India today when they must be ritually reborn from the effigy cow

wrought in gold (the Earthmother) or a newly killed cow or elephant (also the Earthmother) or pass between the forelegs and the hind legs of a living cow before ascending the throne. Lowell Thomas described this ritual not many months ago in his radio reports from the coronation in Nepal. The Peruvian aborigines undoubtedly understood the Earthmother meaning of Manko Capak's ceremony, since this was their sacred island and the walls of the cave shrine were decorated with objects of gold, as befitted the most sacred, lifegiving womb of the Earthmother. The cave on that island was probably the one from which Viracocha was supposed to have emerged from the Earthmother.

Mrs. Verrill has drawn my attention to the great similarity between the arrangement of the Island of Pachacamac, Viracocha's sacred island described by Kiss and Posnansky, and that of the sacred island in the Land of the Blessed in the West, ruled by Osiris and recorded in the Book of the Dead of Egypt as translated by Budge. On it, too, there was a cave in which Quen Quen (Cain ?) the God of the City was born. On this Osirian Isle there was also a temple and a sacred pool. It was surrounded by water. The temple steps are the layers of Heaven corresponding to the steps formed by the branches of the Tree of Life of various peoples, and shown on the seven branched "candlestick" of the Israelites. Could this island represent the holy kiva of the Navajos with its cave, its altar, its ears of white maize pointing to the four cardinal points of the compass (the form of the Suncross), its Tree of Life ladder, and its bowl of salt water? If these islands correspond in religious symbology to those of the Navajo kiva, and I believe that they do, then the bearded, white messengers were not Europeans but probably the Sungod himself, who, in many versions, was born to the Earthmother.

Teharonhiawagon seems to be the Iroquois parallel to the bearded, white missionaries, and for him we have a much more detailed account of his origin and birth.

He with his evil twin brother, Tawiskaron, was born to the Earthmother's daughter, herself also actually an Earthmother, who, dying in childbirth, ascended to Heaven and became the Moon. Teharonhiawagon created all living things including man.

Wickedness came among men before Teharonhiawagon left the earth to be with his grandfathers. This also happened in the story of Viracocha. Teharonhiawagon gathered together all the people of the earth and preached to them a farewell sermon, just as Ipeorkun and Quetzalcoatl had done. He asked the assembled multitude to elect a maiden and a youth to follow him to the end of the earth in order to learn the meaning of life, and Quetzalcoatl took four youths with him to the land's end where he was to embark. As with Quetzalcoatl, Viracocha and Ipeorkun, Teharonhiawagon in his last instructions also predicted that he would be followed by another religious teacher of mankind when there was dire need and the Iroquois say that Teharonhiawagon was actually followed by three other "Hiawathas," namely, Degandawida, Hiawatha, and Ganiodayo (Handsome Lake).

It will be remembered that the bearded, white missionaries were worshipped as gods, but we cannot say positively whether they were gods by birth or by postmortem deification.

One must remember also that the color, white, has usually had the religious meaning of purity and holiness. The light colored metal, gold, was the metal of divinity. The dark silver was the symbol of dark, impure and profane humanity. Thus, only the Inca, the Son of the Sun himself, who was divine, could wear gold. His subjects might use silver.

Definitely associated with the Earthmother religion and probably with similar symbology were the two shells wrought in metal recovered from the tomb of Shubad, an ancient queen in Ur of the Chaldees. One was of gold and the other was of silver. These may have represented celestial and earthly births respectively.

And what about the promise, especially of Veracocha and Quetzalcoatl, that other white men would come? Teharonhiawagon spoke of a successor. The Cuna Ipeorkun also prophesied the coming from Heaven of a series of celestial messengers to teach the Cunas the will of God for their lives. The other messengers, like Ipeorkun, may also have predicted the coming of other heavenly messengers. And certainly the peoples of both Mexico and Peru were expecting the coming of gods and not men, when the conquistadores set foot on their shores.

Although I cannot pretend that the facts which I have arrayed here provide incontrovertable proof of the original divine nature and heavenly origin of the bearded, white missionaries of many Indian tribes, I believe that these facts cannot be omitted from any future considerations of the matter.

BIBLIOGRAPHY

1. Budge, E. A. Wallis. 1901. THE BOOK OF THE DEAD. London.
2. Frazer, James G. 1923. FOLK-LORE IN THE OLD TESTAMENT. N. Y.: Tudor Publishing Co.
3. Graves, Robert. 1948. THE WHITE GODDESS. N. Y.: Farrar, Straus and Cudahy.
4. Henry, Thomas R. 1955. WILDERNESS MESSIAH. N. Y.: William Sloan Associates.
5. Herrmann, Paul. 1954. CONQUEST BY MAN. N. Y.: Harper and Brothers.
6. Keeler, Clyde. 1954. "Cuna Indian Beliefs Concerning the Afterlife." ("Journal of the Tennessee Academy of Science," Vol. 29), pp. 153-162.
7. Keeler, Clyde. 1955. "Cuna Uchus and Catholic Saints." ("Journal of the Tennessee Academy of Science," Vol. 30), pp. 203-211.
8. Keeler, Clyde. 1957. LAND OF THE MOON-CHILDREN. Athens: University of Georgia Press.

9. Radin, Paul. 1944. THE STORY OF THE AMERICAN INDIAN. N. Y.: Liveright Publishing Corporation.
10. Smith, G. Elliott. 1919. THE EVOLUTION OF THE DRAGON. Manchester: The University Press.
11. Tello, Julio. 1931. WIRA-KOCHA. Lima.
12. Verrill, A. Hyatt and Verrill, Ruth. 1953. AMERICA'S ANCIENT CIVILIZATIONS. N. Y.: G. P. Putnam's Sons.

THE SUNGOD SLAYS THE EARTHDRAGON

A Problem in the Study of the Cuna Indian Religion

CLYDE KEELER
Georgia State College for Women, Milledgeville

From Waddell's MAKERS OF CIVILIZATION, RACE AND HISTORY we learn that Uksi of Ukhu (The Hawk of Sunhawk City), the First Sumerian King, was actually the first Aryan King whose solar title was Iksh-Vaku (The Sunhawk), and that he was supposed to have lived some 3378 to 3350 B.C. In Brünnow's list of the bilingual (Sumerian and Babylonian) glossary tablets he becomes deified as the Babylonian Bel, the "Hawk Lord Ukuz I," and he is defined as "The Lord Sakh," called the "Judge of the Mass of the People."

It will be recalled that Zeus the Skyfather has an eagle as a messenger, and that the Sunhawk Horus has a falcon. The distinction between these birds was ill defined by the ancients.

Vishnu is a solar deity. He owns the wonderbird, Garuda, half eagle, half man. He has two consorts, Taksmi the Goddess of Prosperity and Bhu Devi the Earth-goddess. (Since prosperity as well as wisdom is so often the prerogative of the Placental Dragon there is a possibility that Lakshmi is the Placental Dragon or Monster in its treasure-giving form such as found in the Naga Kingdoms under the sea). Khalls of the Okanagans has his Thunderbird.

In the Sumerian and Aryan languages this King Iksh-Vaku may be known also as Zax, with the synonyms DUR, TUR, BUR and PUR. His Sumerian personal name was DAR, DUR, TUR with the prefix of Lord or King (IN, ASH or AN). Thus, he was known as IN-DAR, IN-DURU or IN-DUR. "He was the historical human original not only of the later Sumerian god bearing those names, but also of the god Indra of the Indo-Aryans, Indara of the Hittites and Mitani or Early Medes, and of Thor or Her-Thor the first traditional King of the Goths in the Nordic Epic, the Eddas (wherein he is called Eindri and Andvara, now seen to be a dialectic spelling of Indara) and that he was the original King AR-THUR of the Grail Legend, . . . "

The above are very surprising and disillusioning statements to

those not familiar with this ancient, historical material, but there is more to come.

Waddell states that the title of Indra was not employed in the Indian King Lists, Chronicles or Vedas since these lists were compiled long after the deification of this king, but that a confused memory of the identity of the first Aryan king as Indra survives in his title of Puru-RAVAS (Puru of the Sun). The ancient Vedic commentary in the Brihad-Devata from which this is taken makes Indra "jealous of his (the first Aryan king's) living in wedlock with her (the queen of this first Aryan king) as if he (the first Aryan king) were Indra."

"The Indian Chronicles record . . . 'Iksh-Vaku (Sunhawk) was born from . . . Manu, the Sunborn." Of Manu's one hundred sons, Sakuni (Sargon) and forty-nine others are recorded as ruling the Northern Countries. It is of interest to note that Sargon the Great himself claimed descent from Iksh-Vaku.

In certain of the Vedic hymns this first being appears under his solar title as the founder of an illustrious line of kings, and a votary of Indra (his deified self). He is also described as a "dazzling bright" angel of Indra in heaven, a solar celestial Paradise. There he is in the company of the blessed dead of the Five Tribes of Aryans. This appears, then, to herald the changeover from placing the souls of the dead in the uterus of the Earthmother, to their residence in Heaven with the Fathergod of the Sky.

"Him (Indra) in whose service flourishes Iksh-Vaku, rich and bright,
As (other of ?) the Five (Aryan) Tribes that are in Heaven!
Indra! Support the princely power of Ratha-Prosthas, matched by none,
Even as the Sun for all to see."

Thus, the Sunhawk, Iksh-Vaku or Indra is forever in Heaven to which place he receives the souls of his worshippers. This seems to explain the beginning of the symbol of the Eagle Iksh-Vaku (or its wings combined with the Sun disc), perched above the Tree of Life, variants of which are found all over the world. See figure 1.

It should also be mentioned that Odin is Adamu (Biblical Adam) and Thor. This first "King" Adam of Genesis is made of clay which, we may add, is a world wide detail in the universal Flood Story. It is interesting that Adoni means Lord in Hebrew, and that Odendonnie of the Iroquois is the first man who was modeled out of clay, but we must admit that this similarity of names may be a coincidence.

There probably is some relationship between Her-Thor of the Eddas, sometimes called Eindri, and the Wierd's stone bowl (cauldron) in Ireland which was known as the Undri. Of course, the stone bowl is actually the uterus of the Earthmother, but Thor carried about in his chariot copper cauldron symbols of the Earthmother which would be said to be "his" just as the Cunas call the Earthmother's uterus God's whirlpool.

Waddell says: "The identity of Prince Gunn of Kon or Miok (St. Michael) of the Eddas, the son and successor of the first

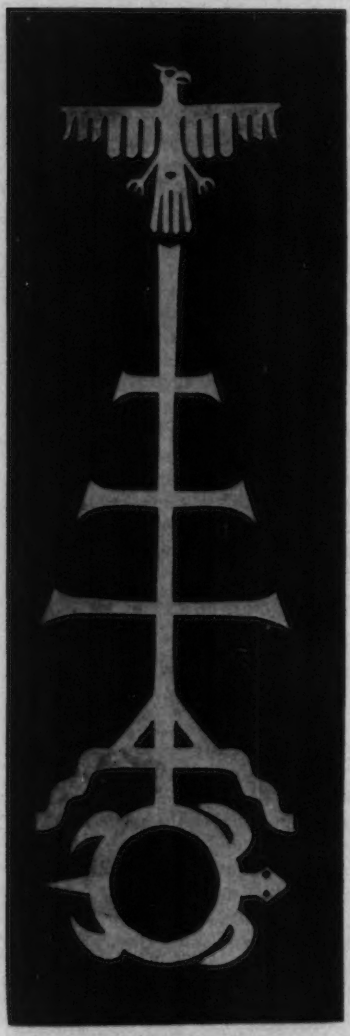


FIGURE 1. *Symbols of the great parturition scene of the Earthmother, showing Placental Dragon in turtle form, the Mount of Gestation (Earthmother's genitals), the Rivers of Life (amniotic fluid), the Tree of Life, and the Eagle or Thunderbird symbol of the Sungod.*

Gothic King Odo, Thor or Adar, with the Cain of Genesis is confirmed by the Eddic Poems which record his slaying, under his title of Miok, of the Chaldean Epli (Abel) of Totun-gardi ("Garden of Eden"), who was an elderly aboriginal Dragon-chief and the arch enemy of Prince Gunn's or Miok's father, opposing the latter in his establishment of civilization. This incident evidently discloses the historical human originals . . . of St. Michael slaying the Dragon Apollyon."

The second Sumerian king, Gin (Nimrod, Michael, etc.) had a net in which he caught the infidels who opposed his father's plan of developing civilization. Niurtu has a net. At the birth of Siddhartha Gotama, the Buddha, to the Earthmother Maya, Brahma and Indra came down to the Lubini grove or garden teeming with flowers and birds, and received the newborn Buddha in a golden net. In addition, two Naga Kings (Placenta of the Earthmother) of the serpent world appeared in the sky and caused two streams to flow, one hot and one cold, for the cleansing bath of the Buddha. The Placenta Monster is often associated with the flow of the Water of Life (amniotic fluid) when the Earthmother bears her children. At the birth of plants, animals and man to the Earthmother, Olowaipippilele, the Cuna Sungod caught the creatures in a golden net and a silver net. Even Yaw (with Sungod attributes) wields a net: "My net also will I spread upon him, and he shall be taken in my snare: and I will bring him to Babylon to the land of the Chaldeans"; Thus, one piece of equipment that Sungods had in common was a net. See figure 2.

"In the Eddas Thor as 'Geor' or 'Geir' kills . . . the Dragon-worshipping aboriginal Chaldean chief who oppressed the people and opposed King Thor in his establishment of the Higher Civilization in Cappadocia and Mesopotamia." The Eddas detail how Her-Thor captured the sacred stone bowl (cauldron) of the Dragon from the weirds at the Well of Urd (Urudu). Here it would appear that the Dragon is considered as a male, but this is an exception. The Dragon is almost always a female.

FIGURE 2. *St. Michael (Murugan, etc.) exhibiting the infidels that he caught in his golden net. Note hawk symbol and foreparts of two lions above net. From the Victory Stele of King Bidasnadi, c. 3050 B.C. After Waddell.*

The sacred bowl was broken when Thor and his son fought the Dragon (Apli, Apla, Ebli, Apli) at Urd where the first Mesopotamian city was to be built.

The University of Pennsylvania expedition unearthed this broken stone bowl from deep beneath the foundations of the central tower of the oldest Sun-temple in Mesopotamia at Nippur, and Waddell came to own the inscribed fragment of this more than 5000 year old relic.

Sir John Marshall says that the Naga people of Northwest India were Serpent worshippers whose great ancestor was supposed to have been present at the time of the Creation of the Ocean. The ancestor was the god of Wisdom and the tutelary deity of mankind. We may say that this description by Marshall makes their ancestor the Placental Monster or Dragon of the Earthmother who is imbued with great wisdom. It became the Salmon of Wisdom to the Druids.

The Placental Dragon was present at the Creation of the Ocean (release of amniotic fluid) by the Earthmother, and is the protector of mankind to American Indians. As the Gorgon, it was created by the Earthmother to protect her sons.

The Placental Dragon is still the protective female line totem in many American Indian tribes. The Tree of Life that grows from its head is the Oracle Tree or Judgment Tree of Southwest Asia and the original Tree of the Totem pole. Upon this pole are carved the totems of each generation of males who have married into the female line and hence have been ceremonially fused once more with the female totem of the Placental Monster somewhat as they were outgrowths of the original Tree of Life (umbilical cord and foetal membranes) at the time when the Earthmother gave birth to them.

The following poem is of interest to our story:

"The god Amar Sin, the Good Shepherd of Nippur,
The mighty Shepherd of Ur,
The Restorer of the Oracle Tree of Urudu City. . . ."

Thus, we learn that there was an oracle Tree of Life as well as a sacred bowl guarded by a Dragon in connection with the vanquished religion. The Hopis have both bowl and tree in connection with worship in the kiva. Here the Cunas have stopped in the evolution of religion, as Chief Ikwaniktipippi tells me that the only importance of the Sungod Olowaipippilele was that he returned to his mother's womb and there investigated the magic by which the Earthmother controls the development of plants, animals and man.

To sum up, there was at Urudu an ancient Earthmother cult, with a sacred stone bowl and a well representing the Earthmother's generative organs. There was a Dragon King (reminiscent of the Naga Kings of India) representing the Earthmother's Placenta that guarded a Holy Oracle Tree of Life (umbilical cord and foetal membranes of the Earthmother) which probably towered above the bowl and well—much as in the descriptions of the idol-well-tree-woman scenes of the HIGH HISTORY OF THE HOLY GRAAL, wherein Sir Lancelot's beloved Guenevere is the Queen of Serpents, a widespread title of the Earthmother. King Her-Thor (Ar-Thur, St. Michael, Adamu, St. George, Indar, Bel, Iksh-Vaku, Odin, Horus, Cain, Odo, Adar, Olowaipippilele's brother Puksu, etc.) killed the Earthmother's Placental Dragon (Abel, Epli, Apla, Ebli, Apli, Ba, Achusimmutupalit, etc.) and by so doing established the cult of the Sungod dedicated to the victor himself. (In volume 14, page 102 of the Bulletin of the Georgia Academy of Science will be found a picture of the slaying of the Earthdragon, Achusimmutupalit).

All this would suggest that the Cain and Abel story of the Bible may represent a somewhat aberrant variation of the original theme. Cain is considered as wicked, Abel as righteous; but, then, there are two aspects of the Dragon. To those of the old Earthmother religion she is protective and beneficent—the Guardian of the Tree of Life. To those who wanted to supplant the Earthmother with her consort, the Sungod, the Dragon was a fierce and evil creature opposed to advanced religious truth and progress.

The Dragon is beneficent in the Orient, but malevolent in Germanic stories such as Beowulf. It becomes the Salmon of Wisdom to the Celts. It is the Ka of Egypt, Vravashi of the Iranians, the Psyche of the Greeks, the Genius of the Romans, the Guardian Angel of Catholics, the Totem of the American Indians.

Near the end of his life when Buddha the Blessed One (born of Maya the Earthmother) sat under the Muchalinda tree and a great storm arose, a Naga King (Protective Totemic Placenta Monster of the Earthmother) wound seven coils about him and formed a canopy over his head.

But the new religion, although it exhalted the Sungod as Skyfather and substituted a dazzling, happy Heaven for departed souls in the sky, for the dingy, horror-ridden, demon-infested Underworld of the Earthmother's uterus, could not destroy the Earthmother cult completely. In the compromise that ensued, the Sungod became the consort of the Earthmother, a consort whose rain is celestial semen constantly fertilizing her and causing her to bring forth.

We have some information regarding the time when the cult of the Skyfather began to replace the worship of the Earthmother, and we might add that probably no greater revolution in religion has ever taken place. Apparently it was when the copper-bronze age replaced the New Stone Age some 4000 to 3000 B.C. Thus, it is a rather apt statement to record, as history does, that the stone bowl was replaced by the copper cauldron.

It would appear that the early proto-Dravidians of the Indus River Valley at Mohenjo Daro, Harappa and other pre-Aryan sites had already made the change, possibly before 4000 B.C. There seems to be evidence that the proto-Dravidians, as traders, may have brought their new goods over into Mesopotamia to the west when the ancient cities of the Tigris-Euphrates Valley were being built, because seals similar to those of the Indus River civilization have been found beneath buildings of the Mesopotamian cities.

FIGURE 3. *The Sungod Marduk and the Dragon Mushussu. Cylinder Seal from Babylon. Ninth Century B.C.*

The Sumerians seem to have taken over the Skyfather idea from these Dravidians and because Ishtar (Earthmother) worship could not be completely destroyed in Mesopotamia, An never did annihilate Ishtar, a new trinity arose consisting of Skyfather, Earthmother and their Warrior Son (the Sungod). See figure 3. Possibly before this the trinity consisted of Earthmother, Placental Monster, and Earthmother's consort.

Although Mohenjo Daro and related sites along the Indus River existed from very early times, possibly 4000 or more years B.C., it has been impossible to date their artifacts accurately. However, it is claimed by Marshall and also by Heras that they are older than Sumer and that Sumerian linear script was imported from Mohenjo Daro. Indeed, there is a late Babylonian tradition to the effect that Sumerian script came from abroad, and was introduced into Mesopotamia by Oannes, Odakon and the half mythical heroes recorded by Borosus.

Mohenjo Daro script, according to Professor Ball, is similar to proto-Chinese, and both may have been derived from a third Asiatic script.

At any rate, Mohenjo Daro appears to be older than Sumeria, and there were contacts between Mesopotamia and the Indus civilization. The great gods are essentially the same in the two places. In Sumer it was An the Creator, Enlil his Son and Ama the Great Mother. In India they are An, Anil and Ama.

The Mohenjo Daro An is represented as nude, may have three faces, four arms, a pose, a dance, and a trident, all of which are distinguishing characteristics of present day Siva. Very early, An has a pigtail or long lock of hair, and table-like throne. See figure 4. Young Horus has a lock of hair, and in the Cuna haircutting ceremony that takes place during the Coming-out party of the debutante the nu saikla frontal lock of hair is cut first. Its cutting probably represents the severing of the umbilical cord. (It will be recalled that the Cuna Earthmother has a table). An is also priapine. This characteristic gave rise to the linga cult, since Hindus today recognize the linga as belonging to Siva.

FIGURE 4. *An surrounded by totems of Proto-Indians. After Heras. According to Heras, the strange translation of the script on this seal reads: "The Lord of the Jar and of the Fish is the weakening and strengthening of the Lord." An is the Lord of the Jar—so often the symbol of the Earthmother's uterus. He is also the Lord of the Fish, possibly a symbol for the Placental Monster.*

Speaking of An's weapon, Heras says: "This trident did actually develop at a later period into two horns plus the crown or helmet in the centre. The trident of the supposed Pasupati seems to be the nearest form to this further development. After this we find a god wearing a crown of horns, developed from the above, in a carving of the Kwrangun rocks in East Elam. We find a further development of the same horn crown in the helmet worn by the Akkadian King Naram-Sin in his famous "Stele of Victory" kept in the Lourve Museum. The statuette of the Phoenician god Ba'al recently discovered at Ras Shamra wears a similar crown, which suffers a quaint evolution in the person of the same god represented in the great stele unearthed in the same place. After this, the number of horns grows, three pairs appearing at times round the crowns of Assyrian Kings."

Psalm 74 reads, "And I will break all the horns of the sinners; but the horns of the just shall be exalted."

"And Habakuk declares: 'His brightness shall be as the light, horns are in his hands!' " This possibly refers not to crowns but to a trident.

An is often associated with an arbor made by bending a live, sacred pipal fig tree. In fact, in spite of Heras' idea that the headdress of An is a stylized trident, a more logical explanation of the headdress found on several most ancient seals is that of a fig tree. Figure 5. It is hardly to be expected that the central prong of a trident would be wide like the trunk of a tree, that the lateral prongs

would curve in, destroying their utility, and that they would also bear flowers.

An may take eight forms during the year as he, the Sungod, passes through the eight ancient zodiac signs of Ram, Harp, Crab, Mother,

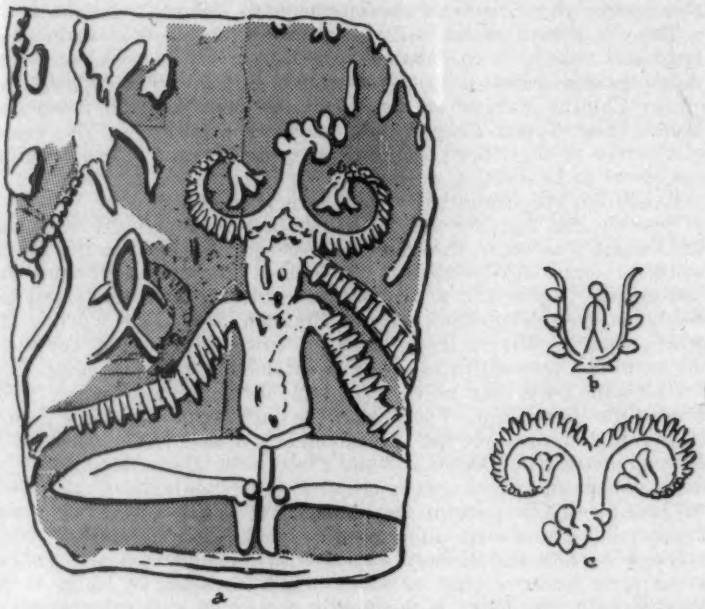


FIGURE 5. *(a) An as shown on seal 235 of the Archeological Survey of India. (b) An with pipal fig tree motif. (c) Headdress of An, presumably a Tree of Life motif. After Heras.*

Scale, Arrow, Jar and Fish in his daily ascension throughout the year.

Thus, we read in one inscription: "That (is) the eight (formed) God, whose one side (form) is the Sprinkled Great Fish."

The old year ended with the Fish and subsequently the new year began with the Ram. Hence An is the God of the beginning and the end of the year, like the Alpha and Omega, and as such his Ram-Fish form was frequently worshipped. Thus, the Ram-Fish during the course of the centuries probably evolved into Capricornus, which is the Placental Monster of the Earthmother, and which is associated with the Creation of Plants, Animals and Man, just as presumably the Ram-Fish was associated with the death and resurrection or rebirth of the Sungod at the winter solstice in Mohenjo Daro.

Here and there among the great number of seal inscriptions excavated at Mohenjo Daro and related sites are found ones that make

meagre suggestions as to the type of religion followed by the inhabitants of those most ancient cities.

One says: "Those are the middle mountains of the holy Fish of the Valadas."

Another records: "In the city of the high sun of the Lord of the rain clouds, the carriers of domination have finished (perished)."

There is at least one sacred tree (probably an oracle tree) in every town and village, as in Java today. An inscription speaks of: "The judgment tree which is in the country." Again: "The judging tree of the Shining Farmer of the Crab (the King) of the prosperous Minas (Fish Totem People) who is in the country." "The houses of the tree of the village of the prosperous Minas." Marshall thinks the Minas to be ascetics, possibly living in caves.

Evidently, the sacred trees could own property.

Trees in the Sun are mentioned, so they may actually have had the Cosmic Tree story, the Tree that reached from Hell in the Earthmother's womb up to Heaven, and since this tree represents the Earthmother's placenta and umbilical cord they must have had the Earthmother's Parturition story of Creation. See figure 1. Thus, the oracle trees or judging trees possessing great wisdom may represent the umbilical tree with the wise Placental Monster at its roots.

Fish and Trees may be associated in Mohenjo Daro as in: "The Tree of the Fish," and "The Tree of the dark beginning of the Fish." If the Fish represents the Earthmother's Placental Monster as it does in the story of Manu and the Flood, its "Dark Beginning" in the womb of the Earthmother is quite understandable.

There are a few inscriptions referring to Death as in: "The two Trees under which seven shining ones saw the God of Death."

Linga worship had already appeared and in one case a linga was worshipped under a pipal or sacred fig tree, which in India is the Tree of Life. The linga is frequently connected with Sun worship. Certain famous linga shrines apparently held property as witnessed by the inscription: "That is the palm grove of (belonging to) the linga." The linga is said to be the phallos of An, just as in India today it belongs to his later counterpart, Siva, and hence it represents the creative power of the Creatorgod, as we have mentioned above.

The Great Fish was worshipped in the mountains. "Those are the middle mountains of the holy Fish of the Velalas, (the trident people)."

"The moon (is) over the white mountain of he of Velan (An) of the linga of the divided house of the two suns." Today Siva has his dwelling place at Kailara, a peak of the Himalayas, which represents the Earthmother, or the genitals of the Earthmother.

An's son is named Murugan. Once Chief Nallia Kodan prayed to Murugan (Subramanya) for help against his enemies. In reply, Murugan told him to go to a sacred well and pick a lotus. Arriving at the well Nallia Kodan found not a lotus, but the trident of Murugan which he removed and with which he worsted his foes. The sacred well is probably the genitals of the Earthmother as it is in the

Holy Graal story and Druid religious accounts in general. If so, then the lotus probably represented the Tree of Life (umbilical cord and foetal membranes) as it does in Egypt and among the Hindus today.

It will be recalled that the stone mortar of the Aryan sacrificial ritual described in the Satapatha Brahmana is the Earthmother's uterus and that the same is true among many Indians including the Cunas. From Southern Mexico Matthew Stirling has described a number of stone mortars or stones slightly concave behind which have stood a stone linga.

CONCLUSIONS

From a comparison of the stories of the Sungod slaying the Dragon, as recounted in various ancient civilizations, I am inclined to the opinion that they all are derived from a common origin. They may represent, as Waddell suggests, the ascendancy of a "new religion," over a "more ancient faith." If this be true, then we may say that the new religion is that of the Sungod and that it is the Earthmother religion which is superceded, at the period when patriarchy overcame matriarchy, that is, at the time of the development of copper and bronze cultures about 4000 B.C. Descriptions of symbolical significance of both stone and bronze age appear in the HIGH HISTORY OF THE HOLY GRAAL.

Actually, this slaying of the Dragon (Placenta) is tied up with the Flood Story which is part of the Epic of Creation as we have shown in previous publications, and this theme is dealt with in the poems, songs and art of many peoples. In trying to trace the origin of the Dragon Story in written record one is led back via Sumerian linear script to Mohenjo Daro, but some versions, including many in America, may belong to an illiterate past before the time of those Indus River proto-Dravidians. They and the stories of Mohenjo Daro may have come from a common, more ancient source.

ACKNOWLEDGEMENT

In the study here described I am greatly indebted to Mrs. Ruth Verrill, who has generously supplied me with notes from her voluminous files, and with very pertinent suggestions from her wide experience in dealing with ancient cultural materials.

BIBLIOGRAPHY

1. Budge, E. A. Wallis. 1901. THE BOOK OF THE DEAD. London.
2. Bühler, G. 1886. THE LAWS OF MANU. THE SACRED BOOKS OF THE EAST. Oxford: Clarendon Press.
3. Eggsling, Julius. 1882. THE SATAPATHA BRAHMANA. THE SACRED BOOKS OF THE EAST. Oxford: Clarendon Press.

4. Evans, Sebastian. 1929. THE HIGH HISTORY OF THE HOLY GRAAL. London: I. M. Dent and Sons, Ltd.
5. Graves, Robert. 1948. THE WHITE GODDESS. New York: Farrar, Straus and Cudahy.
6. Henry, Thomas R. 1955. WILDERNESS MESSIAH. New York: William Sloan Associates.
7. Heras, H. 1938. "The Origin of the Round Proto-Indian Seals Discovered in Sumer." (B. B. AND C. I. ANNUAL).
8. Heras, H. 1938. "The Tirayars in Mohenjo Daro." (JOURNAL, Bombay Branch, ROYAL ASIATIC SOCIETY 14: 73-78).
9. Herrmann, Paul. 1954. CONQUEST BY MAN. New York: Harper and Brothers.
10. Keeler, Clyde. 1956. "The Worship of Ishtar Among the Cuna Indians of San Blas." (BULLETIN GEORGIA ACADEMY OF SCIENCE 14: 19-26).
11. Keeler, Clyde. 1957. LAND OF THE MOON-CHILDREN. Athens: University of Georgia Press.
12. Marshall, Sir John. 1931. MOHENJO-DARO (Volume 1). London.
13. Smith, G. Elliott. 1919. THE EVOLUTION OF THE DRAGON. Manchester: The University Press.
14. Sen, Emerson and Gertrude. 1948. THE PAGEANT OF INDIA'S HISTORY. London: Longmans, Green and Co.
15. Stirling, Matthew. 1943. STONE MONUMENTS OF SOUTHERN MEXICO. Washington: United States Government Printing Office.
16. Verrill, A. Hyatt, and Ruth. 1953. AMERICA'S ANCIENT CIVILIZATIONS. New York: G. P. Putnam's Sons.
17. Waddell, L. A. 1929. MAKERS OF CIVILIZATION, RACE AND HISTORY. London: Luzac.
18. Waddell, L. A. 1929. PHOENICIAN ORIGIN OF BRITONS AND SCOTS. London: Luzac.
19. Waite, A. E. 1909. THE HIDDEN CHURCH OF THE HOLY GRAAL. ITS LEGEND AND SYMBOLISM. London: Rebman.

FLAGS BEARING SYMBOLS OF THE EARTHMOTHER RELIGION OF THE CUNA INDIANS

CLYDE KEELER
Georgia State College for Women, Milledgeville

Ancient religious symbols are often associated with national origins and history. Frequently they represent tribal totems, and at other times they are gods or cultural heroes and their associates performing feats of valor and magic at the Creation of the tribe, fighting evil in the form of demons, securing the necessities of life, or bringing techniques and civilization to their people. Thus, it is only natural that such symbols should be preserved in heraldry. For this reason coats-of-arms and national banners might be expected to yield various devices illustrative of the old Earthmother religion. If one examines FLAGS OF THE WORLD by H. Gresham Carr, the validity of such a supposition may be tested.

The Cross of St. George, which appears on so many flags of British origin, is historically the Suncross of Geor who fought the Earth Dragon in the Eddas, really the Placental Monster. The Fleur-de-Lis is sometimes the Lotus of Birth but one cannot, I believe, trace the heraldic form as employed in France to this religious symbol.

If the lions of Europe find their origin in the lions of Sumeria and Akkadia, as is possible, then they are descended from Khumbaba, the Placental Monster of the Gilgamish Epic. There are few Britishers, I believe, who would relish such an origin.

The Roman, and hence later European Eagles, probably inherit from the Eagle of Zeus.

When we examine the Red Dragon of Cadwallader, we cannot escape the fact that this is the Druid Dragon, the Dragon of Parthia, and hence the Earthmother's Placenta. It is the Salmon of Wisdom in other instances among the Celts. It is the original Gorgon.

The President's Flag of the Republic of India bears a collection of Earthmother symbols. It bears the Asoka Lions, the White Elephant of the Placenta and the Lotus Bowl of Prosperity and Plenty which is really the Earthmother's uterus containing a bouquet made of buds and flowers of the Lotus of Birth.

The symbol of the flag of New Mexico is simply the ancient Zia Sun Symbol. The flag of Oklahoma depicts an Indian peace pipe which is the Earthmother's bodily altar to the Sungod.

The flag of Mexico shows the Eagle fighting the Rattlesnake, which probably represents the Sungod slaying the Earthdragon.

The Argentine flag features the Sungod as does that of Bolivia, Equador and Uruguay, complete with faces and sometimes rays. (I have not mentioned the many cases of sun or moon lacking the celestial face such as found on the Turkish and other flags). The Flag of Guatemala pictures the holy Quetzal bird that bore in its body many symbols of the Earthmother religion. It is of interest to note that all that the sacred tribal medicine bag of the Omahas contained was a mummified quetzal.

EARTHMOTHER SYMBOLS FROM FLAGS OF THE WORLD.

(1) Three headed white elephant and umbrellas?, on the flag of Laos. The elephant is the Placental Monster and the umbrellas may represent the Tree of Life. (2) Yang and Yin symbols on the flag of South Korea, also Sikkim. Here it probably represents the Sungod and the Earthmother. (3) Symbols on the flag of the Mongolian People's Republic: Star of Russian Revolution plus old religious symbols of Flame, Sun, Moon, Triangles, Bars of Opposites, Yang and Yin. (4) Red Dragon of Cadwallader as shown on the flag of Wales. This is the Placental Monster. (5) Lotus Bowl on the President's flag in India. The Bowl is the Earthmother's Uterus and the Lotus is the Umbilical Cord and Foetal Membranes. (6) Garuda, the Bird-Man of Vishnu from the Royal Standard of Thailand. (7) Quetzal bird from the flag of Guatemala. This bird represents a number of symbols in the Earthmother religion.

The Potowatomi Medicine Chief, Shup-She, explained to me the symbology of this quetzal. The long, irridescent tail symbolizes the phallos of the Sungod. The eyes are life. The red head is the sun trinity of fire-light-heat. There is the beauty and flash of lightning in the reflection from the feathers. The green color stands for growing things born of the Earthmother. White is for purity or sacredness. The crest stands for a chief or divinity.

The Israeli flag bears the "Star of David" composed of superimposed triangles that may have originated as a fertility symbol found in the Earthmother religion. The Laos flag shows a three headed White Elephant surmounted by a five-fold protective umbrella? The white elephant is the Placenta which suggests that the umbrella actually is the Tree of Life or the Umbilical Cord and Foetal Membranes that were protective. There are other reasons why the umbrella may be considered as the umbilical cord, and foetal membranes, such as the overshadowing hoods of protective cobras (Naga Kings) in India and the association of a placental monkey with the umbrella in Southern Mexico and Panama.

The flag of South Korea bears the Yang-Yin symbol of the complementary nature of Skygod and Earthmother, the hermaphrodite Pasupati or Nut and Geb before their separation by Shu (atmosphere) to form Heaven and Earth (Skygod and Earthmother). That of the Mongolian People's Republic—assembles a flame, the sun, the moon, two triangles, and two pairs of bars representing opposites such as maleness and femaleness, day and night, good and evil, all of ancient religious significance.

The flag of Thailand bears the "Sacred White Elephant," Placenta symbol. Before the Siamese cultural ancestor, Zacca, was born his mother dreamed that she gave birth to a white elephant. Zacca changed 80,000 times and at last became a white elephant, fulfilling his mother's dream. The Royal Standard of Thailand is yellow and exhibits in red the device of the fierce Garuda, the Bird-Man of Vishnu.

The Butan State Flag bears the wingless Oriental Dragon that may be identified as the Placental Monster (recalling the Imperial standard of China with its deerhorns and five toes to each foot). The Sikkim flag has the Wheel of the Law with the Yang and Yin symbols at its center. The wheel of the Law may be the annual journey of the sun. Nepal standards show sun, moon and lion.

The Lebanese flag exhibits the original Giant Cedar Tree of Life spoken of in the Bible and such Mesopotamian stories as the Gilgamish Epic.

On the Emperor's standard in Ethiopa there is the scene of St. George killing the Dragon, proven to be the Sungod and Earthdragon. It is drawn in European style. On the Tibetan flag one finds the Kilin lions fighting for a Pearl. Above them hangs a flaming gem. These are probably religious symbols of the Earthmother.

On the standard of the Head of State of Spain one sees the Pillars of Hercules and between them in the sea lane facing each other one

finds the "dragantes lobos" (wolf dragons) which probably are derived originally from the Placental Dragon.

CONCLUSION

The flags of many nations still preserve a memory of the ancient Earthmother religion in the symbols that they bear.

BIBLIOGRAPHY

Carr, H. Gresham. 1956. FLAGS OF THE WORLD. London: Frederich Warne and Co., Ltd.

DIRECTORY 1957

MEMBERSHIP—NOVEMBER, 1957

ABBOTT, DR. OSLER A., V, Emory University Hospital, Emory University
ADAMS, DR. CARSHIE C., II, Nat'l Research & Development Co., 41 Peachtree Pl.
ADAMS, GEORGE W., I, Roswell
AHLQUIST, DR. RAYMOND P., FV, Medical College of Ga., Augusta
AJELLO, DR. LIBERO, V, 30 Kensington Rd., Avondale Estates
ALDREDGE, PROF. E. W., I, II, IV, Ga. Inst. of Tech.
ALLEN, DR. ROBERT I., IV, Physics Dept., Ga. State Coll. Bus. Ad.
AMSLER, B. M., 331 Winona Dr., Decatur
ANTHONY, DR. J. D., I, North Georgia College, Dahlonega
ASEFF, GEORGE V, II, IV, 1015 Avondale Ave., S.E.
ASHER, MRS. MARY BISHOP, II, 585 Seminole Ave., N.E.
ATKINSON, MRS. GLADYS P., VII, 3541 Kingsboro Rd., N.E.

BABCOCK, LEROY E., IV, Valdosta State College, Valdosta
BAILEY, MISS A. CLARA, II, 3651 Log Cabin Dr., Macon
BAILEY, E. A., IV, LaGrange College, LaGrange
BAKER, DR. W. B.,FI, Dept. of Biology, Emory University
BANKSTON, PRESTON T., IV, Box 148, Ga. Inst. Tech.
BARGREN, WILLIAM C., I, VI, 1664 Hadlock St., S.W.
BARNES, JAMES A. III, Dept. of Geography and Geology, Univ. of Ga., Athens
BARNETT, JEAN PAUL, I, II, South Ga. College, Douglas
BARR, DR. THOMAS A. JR., IV, 278 Hodgson Dr., Athens
BAUM, JOHN P., IV, Box 443, Milledgeville
BEADLE, MISS MARY E., I, 931 Courtenay Dr., N.E. (6)
BEALL, WARE T., IV, 232 East 60th Street, Savannah
BEAM, R. E.
BEATTY, DR. A. V., FI, Dept. of Biology, Emory University
BEAUCHAMP, R. O., I, Tenn. Corp. Res. Lab., College Park
BECK, DR. EDWIN G., I, Dept. of Botany, Univ. of Ga., Athens
BECKWITH, W. S., 731 Cobb St., Athens
BELCHER, ROBERT H., II, Box 57, Dahlonega
BELLER, DR. HARRY E., V, VI, 743 DuPont Bldg., Miami 43, Fla.
BELLINGER, DR. FREDERICK, FIV, Engin. Experiment Sta., Ga. Inst. of Tech.
BELSER, RICHARD B., IV, 1543 Fairview Rd., N.E.
BENDER, DR. C. R., II, The Coca-Cola Co., Box 1734
BENNETT, DR. F. W., FI, College of Agriculture, Univ. of Ga., Athens
BENNETT, MISS ZONA C., I, 50 Westminster Dr., N.E.
BERCOS, DR. JAMES, IV, 71 Hardeman Rd., N.E.
BERNARD, GOULD E., II, 41 Marietta St., N.W. (3)
BEYNON, DR. LISABETH H., II, VII, Wesleyan College, Macon
BLOCKER, HAROLD G., IV, 1370 Briar Vista Terr., N.E.
BLAKE, BILLY BRUCE, I, 189 Conway Rd., Decatur
BLANCHARD, DR. WESLEY A., II, 405 Marianna Dr., Wilmington, Del.
BLASINGAME, WILLIAM E., I, Ga. Dept. of Entomology, 304 Agric. Bldg. (3)
BLUMENSTEIN, CARL R., II, Windtop, Route 3, Marietta
BOGUSLAVSKY, MRS. SERAPHIMA, I, II, Aramco Overseas Co., Laan van Meerdarvoort, The Hague, Netherlands
BOLEN, PAUL, II, VI, 2613 Helen Street, Augusta
BOLES, DR. RALPH C., IV, Math. Dept., Mercer Univ., Macon
BOLTON, DR. EURI BELLE, V, G.S.C.W., Milledgeville
BOOLE, DR. JOHN ALLEN, I, 305 S. Main Street, Statesboro

BORMANN, DR. F. H., I, Dept. of Biology, Dartmouth College, Hanover, N. H.
BOSWELL, R. D. JR., IV, 131 S. Milledge Ave., Athens
BOWLES, DR. LESTER L., FV, Medical Coll. of Ga., Augusta
BOWMAN, B. U., I, VA Hospital, 5998 Peachtree Rd.
BOYD, DEAN GEORGE H., FI, Graduate School, Univ. of Ga., Athens
BRADLEY, EDWARD L. SR., III
BRADLEY, DR. G. H., I, 4200 Cathedral Ave., N.W., Washington, D. C.
BRECK, FRED I. JR., II, 2505 B Morosgo Way, N.E.
BRENDER, ERNST V., I, 594 Emily Place, Macon
BRIDGEMAN, DR. ANNA JOSEPHINE, I, Agnes Scott Coll., Decatur
BRIGGS, DR. A. P., FV, Medical Coll. of Ga., Augusta
BRILLHART, WM. E., I, Dept. of Biology, Emory University
BRITT, MISS MARY LOU, Abraham Baldwin Coll., Tifton
BROCKMAN, DR. C. J., II, 336 Hill Street, Athens
BROGAN, WILLIAM, II, I, V, 78 Sheridan Dr., N.E.
BROOKE, DR. M. M., FI, 1585 Emory Road, N.E.
BROWN, DR. ACTON R.. I, 160 Hope Avenue, Athens
BROWN, ANNIE SUE, Atlanta Board of Education, City Hall
BROWN, DR. M. GORDON, II, IV, VI, 32 28th Street, N.W., Apt. 104
BROWN, JOHN L., IV, Eng. Expt. Sta., Ga. Inst., Tech.
BUCKNER, MISS ANNETTE, I, II, Route 3, Box 420, Savannah
BUNDY, MISS WILHELMINA E., I, 183 Lamont Dr., Decatur
BURBANCK, DR. W. D., FI, Dept. of Biology, Emory University
BURGESS, CHARLES T., II, IV, 4739 Raymond Dr., Doraville
BURNETT, MRS. LUCILLE, I, II, IV, 2851 Shallowford Terr., Chamblee
BURNS, DR. ROBERT E., I, Experiment
BURROWS, MR. W. H., FII, Dept. of Chemistry, Ga. Inst. of Tech.
BUSH, POWELL D. JR., IV, Route 6, Marietta
BUTTS, NORMAN C., I, 3315 Peachtree Road

CALAWAY, DR. P. K., FII, Dept. of Chemistry, Ga. Inst. of Tech.
CALDER, DR. W. A., FIV, Agnes Scott College, Decatur
CALDWELL, MRS. HARMON W., I, 68 Burge Apts., 595 McAfee St.
CALHOUN, DR. F. P., FV, 820 Doctors Bldg., 478 Peachtree St., N.E.
CALLAWAY, BRANTLEY M., IV, 1716 McLendon Ave., N.E.
CALLAWAY, HOWARD, I, Blue Springs Farms, Hamilton
CAMPBELL, PHIL, I, State of Ga. Dept. of Agric.
CAMPBELL, DR. W. A., I, School of Forestry, Univ. of Ga., Athens
CANDLER, DR. MARGUERITE L., V, 3092 Argonne Dr., N.W. (5)
CANNON, ALBERT E., I, 1189 Beech Valley Rd., N.E.
CARLTON, DR. JACK K., II, Chemistry Dept., Ga. Inst. Tech.
CARLTON, MISS VIRGINIA, Wesleyan College, Macon
CARLTON, DR. WILLIAM M., I, Dept. of Botany, Univ. of Ga., Athens
CARNEY, DR. SEATON E., II, 340 New Castle St., New Wilmington, Pa.
CARR, GROVER V., III, 2715 Schaul St., Columbus
CARTER, DR. MARJORIE E., I, Valdosta State College, Valdosta
CARTER, ROBERT L., II, III, Ga. Coastal Plains Exp. Sta., Tifton
CARVER, DR. GAIL L., FI, Mercer Univ., Macon
CASPER, ARTHUR W., IV, 1320 E. 32nd St., Savannah
CECIL, SAMUEL R., II, I, 331 N. 25th St., Cornwallis, Oregon
CHAMBLISS, DR. ROLLIN, VI, 315 Lake Dr., Athens
CHAPIN, LLOYD W., VI, 248 Camden Rd., N.E.
CHASON, A. L., II, P.O. Drawer 1734
CHEATHAM, MISS CORA LEE, VII, Apt. 4, Wildwood Court, Columbus
CHENG, F. W., II, Box 84, East Point
CHENG, WU-CHIEH, II, Union University, Jackson, Tenn.
CHOQUETTE, J. A., III, P.O. Box 1188
CLARK, LT. DALLAS W., II, 04011960, Co. M., 33rd Inf., Ft. Davis, Canal Zone
CLARK, DR. MARION T., FII, Dept. of Chemistry, Emory University

CLEMENT, DR. A. C., FI, Dept. of Biology, Emory University
COFER, HARLAND E., III, Dept. of Geology, Emory University
COFIELD, EUGENE P., II, 2691 Howell Mill Rd., N.W.
COGGINS, DR. H. T., FII, Dept. of Chemistry, Univ. of Ga., Athens
COHEN, DR. ARTHUR L., I, Oglethorpe University
COLEMAN, GEORGE D. JR., II, IV, 1366 DeSoto Ave., S.W.
COLQUITT, MISS WINNIFRED, VII, 3796 Berkley Dr., Macon
COLTON, DR. ERVIN, II, 1625 McLendon Ave., N.E.
CONROY, EDWARD H. SR., II, Box 89, College Park
COOLEDGE, HAROLD N. JR., II, P.O. Box 866
COOPER, MRS. AUGUSTA SKEEN, FII, Dept. of Chemistry, Emory Univ.
COOPER, MISS BELLE, II, 1143 St. Charles Pl., N.E.
COOPER, DR. C. D., IV, Physics Dept., Univ. of Ga., Athens
COOPER, DR. F. W., V, Emory Univ. Hosp., Emory University
COWIE, DR. LILLIAN M., Biology Dept., Wesleyan Coll., Macon
COWN, WILLIAM B., I, II, Engr. Exp. Sta., Ga. Inst. of Tech.
CRIGLER, DR. ELIZABETH, II, Agnes Scott College, Decatur
CRONHEIM, S. P., III, 65 Forsyth St., N.W. (3)

DALLA VALLE, PROF. J. M., FIV, Chemical Engr., Ga. Inst. of Tech.
DALLY, MISS CLARA G., I, II, Truett-McConnell Jr. Coll., Cleveland
DALTON, HOWARD L., I, 526 Highland Ave., Athens
DARLINGTON, DR. JULIAN T., I, Shorter Coll., Rome
DARSEY, MISS CAROLYN, 805 Forrest Ave., LaGrange
DAUGHERTY, P. M., II, 2229 Bolton Dr., N.W. (18)
DAVID, MISS ESTELLE, I, Box 53, Dahlonega
DAVIDSON, MRS. ELIZABETH A., I, 702 N. Main St., East Point
DAVIS, MISS DORIS E., II, I, 314 Grady Ave., Rome
DAVIS, MISS MYRTIS, IV, 174 Rest Haven Ave., Macon
DETTELBACH, LOUIS L., II, 5045 Peachtree Rd., N.E.
DEXTER, DR. EMILY S., FV, Dept. of Psychology, Agnes Scott Coll., Decatur
DICKEY, WM. J., IV, Box 243, Oxford
DICKINSON, WM. E., II, 1300 Manor Place, S.W.
DIMMOCK, WILLIAM E., II, P.O. Box 1477 (1)
DIXON, DR. E. H., FIV, Dept. of Physics, Univ. of Ga., Athens
DOHERTY, EDWARD E., II, Hill St., Buford
DORSEY, GEORGE A., I, Darlington School, Rome
DOZIER, MISS MARY LOUISE, IV, 3157 Napier Ave., Macon
DRIFTMIER, R. H., IV, 679 Hill St., Athens
DUCKWORTH, WILLIAM C., II, 5118 N. Ivy Rd., N.E. (5)
DUNCAN, DR. A. O., 1870 S. Lumpkin St., Athens
DUNCAN, DR. WILBUR H., FI, Dept. of Botany, Univ. of Ga., Athens
DYER, DR. ROLLA E., FI, Woodruff Bldg., Emory University

EAGON, DR. ROBERT G., I, Bacteriology Dept., Univ. of Ga., Athens
EDENFIELD, MISS MARGARET, IV, 1008 Holt Ave., Macon
EBERHARDT, DR. W. H., FII, Dept. of Chemistry, Ga. Inst. of Tech.
EDWARDS, DR. A. S., FV, Univ. of Ga., Athens
EDWARDS, MRS. BETTY F., I, 1625 Boulevard, N.E.
EDWARDS, DR. H. L., Apt. 9-B, 4100 Peachtree Rd., Brookhaven
EDWARDS, WILLIAM W., JR., V, 896 Virginia Circle, N.E.
ELLIS, MRS. RUTH H., I, Box 332, Wilmington Isle, Savannah
ETHERIDGE, OWEN E., III, 506 S. Harris St., Sandersville
EVANS, PROF. TREVOR, IV, VI, 2080 N. Decatur Rd., N.E.
EZZARD, MISS ANN, I, II, 256 S. Colonial Homes Cir., N.W.

FAIR, DR. JOHN R., V, Medical Coll. of Ga., Augusta
FALES, DR. FRANK W., I, Dept. of Biochemistry, Emory University
FANNING, ODOM, VI, Midwestern Research Assoc., Kansas City, Mo.
FARBER, NATHAN, V, Escambia Child Guidance Clinic, 805 N. Spring St., Pensacola, Fla.

FELLOWS, GEORGE R., II, Rockbridge Rd., Stone Mountain
FERST, M. A., IV, 1108 Wm. Oliver Bldg.
FETNER, DR. ROBERT H., I, Eng. Expt. Sta., Ga. Inst. of Tech.
FETZ, RICHARD H., II, Ga. Dept. of Public Health
FEURT, DR. SELDON D., I, V, School of Pharmacy, Univ. of Ga., Athens
FINCHER, E. L., I, 5336 Greenland Rd., N.E.
FLANDERS, MISS BRUCE C.
FLEMING, DR. ATTIE A., I, Dept. of Plant Pathology, Univ. of Ga., Athens
FORD, DR. GROVER M., II, Dept. of Chemistry, Mercer Univ., Macon
FORESTER, DR. H. B., I, Dept. of Biology, North Ga. Coll., Dahlonega
FOSTER, DR. A. A., I, Ga. Forestry Center, Dry Branch
FOSTER, DR. JOHN W., I, School of Veterinary Medicine, Univ. of Ga., Athens
FRASHIER, DR. LOYD D., FII, Dept. of Chemistry, Ga. Inst. of Tech
FRIEDLANDER, DR. GEORGE, II, I, 940 Springdale Rd., N.E.
FRIEDMAN, DR. H. B., FII, 2690 Margaret Mitchell Dr., N.W. (5)
FRIERSON, DR. W. JOE, FII, Agnes Scott Coll., Decatur
FROBISHER, DR. MARTIN, FI, 374 Ruckman Rd., Closter, New Jersey
FULLER, DR. HENRY L., I, 220 Hillcrest, Athens
FULMER, DR. H. K., FIV, Dept. of Mathematics, Ga. Inst. of Tech.
FURCRON, DR. A. S., FIII, Agric. Bldg., 19 Hunter St. (3)
FUTRAL, JOHN G., I, IV, Ga. Expt. Sta., Experiment

GAERTNER, MR. M. A., II, Ga. State Coll. of Business Adm.
GALLE, FRED C., I, Ida Cason Gardens, Chipley
GANSWICH, WILLIAM G., II, Route 3, Box 187, College Park
GARRETT, DR. JAMES R., IV, 652 Collier Rd., N.W.
GATZ, DR. ARTHUR J., V, I, Med. Coll. of Ga., Augusta
GERSCH, HAROLD A., IV, Ga. Inst. of Tech.
GIDDINGS, DR. GLENVILLE, SR., V, 478 Peachtree St., N.E.
GIFFORD, DR. GEORGE I., II, 190 Highlands Terr., Athens
GILCHRIST, PROF. PHILIPPA, FII, Chemistry Dept., Wellesley Coll., Wellesley, Mass.
GLAZER, DR. ISAAC, I, 914 Doctors Bldg., 478 Peachtree St., N.E.
GOETHE, C. M., I, III, 720 Angle Bank Bldg., Sacramento 14, Calif.
GOFF, DR. JOHN H., III, 1021 E. Clifton Rd., N.E.
GOODE, MISS JULIA P., II, Feldwood Rd., Route 1, College Park
GOODWIN, DR. M. H., FI, U.S.P.H.S., 50 7th St. Bldg.
GORDON, MENDEL T., III, 970 Parkway Dr., N.W.
GOTESKY, DR. RUBIN, FVI, Dept. of Philosophy, Univ. of Ga., Athens
GRANT, DR. W. H., III, Geology Dept., Emory University
GRAY, DR. STEPHEN W., FIV, Dept. of Anatomy, Basic Science Bldg., Emory University
GRAY, MRS. STEPHEN, FI, Biology Dept., Agnes Scott Coll., Decatur
GREEN, MARY NANCY, II, Harvard School of Public Health, Nutrition Dept. 1, Shattuck St., Boston, Mass.
GREENBLATT, DR. ROBERT B., V, Medical Coll. of Ga., Augusta
GREENE, DR. JAMES E., V, VI, Peabody Hall, Univ. of Ga., Athens
GROSECLOSE, MISS NANCY, I, Dept. of Biology, Agnes Scott Coll., Decatur
GROVENSTEIN, DR. ERLING JR., II, Dept. of Chem., Ga. Inst. of Tech.
GRUNE, DR. WERNER, I, 317 4th St., N.E.
GUERRANT, WILLIAM B., II, 4310 Twin Brook Rd., Apt. 3, Brookhaven
GUNTER, MRS. MARGARET, VII, 17th Ave., Columbus
GUPTILL, PAUL L., I, 1405 Wessyngton Rd., N.E.

HAINES, T. P., I, Dept. of Biology, Mercer Univ., Macon
HALDI, DR. JOHN, FV, Physiology Dept., Emory University
HALL, MRS. FRANCES, FI, 245 W. 101 Ave., Apt. 4, New York 27, N.Y.
HALL, DR. W. KNOWLTON, FV, Medical Coll. of Ga., Augusta
HAMILTON, DR. W. F., FV, Medical Coll. of Ga., Augusta

HANNER, W. S., II, 457 S. College, Statesboro
HANSARD, WILLIAM CAREY, 2345 Cheshire Bridge Rd., N.E.
HANSON, H. S., III, II, Emory-at-Oxford, Oxford
HARBIN, MISS ANNE, I, II, 995 Byron Dr., S.W.
HARRIS, JOSEPH B., I, Dept. of Botany, Duke Univ., Durham, N. C.
HARRIS, LUCIEN, JR., FI, The Macmillan Co., 1360 Spring St., N.W.
HARTSHORNE, DR. CHARLES, I, 2075 Ridgewood Dr., N.E.
HARVEY, JOHN W. D., II, 2746 Dover Rd., N.W.
HAWES, FOREMAN M., II, Pres., Armstrong Coll., Savannah
HAWKINS, MISS LAURA SUE, II, IV, 430 W. Taylor St., Griffin
HAYNES, CURRY T., I, Emory-at-Oxford, Oxford
HEFNER, DEAN RALPH, FIV, Dept. of Math., Ga. Inst. of Tech.
HENDREN, DR. L. L., FIV, Springdale Farm, Jefferson Rd., Athens
HENKEL, DR. JOHN H., IV, Physics Dept., Univ. of Ga., Athens
HENRY, ARTHUR M., FI, 1177 Zimmer Dr., N.E.
HENRY, DAN, II, Law and Co., Box 1558
HENRY, G. C., II, Law and Co., Box 1558
HENRY, PROF. GILBERT, IV, Dept. of Physics, Univ. of Ga., Athens
HERREMAN, DR. H. M., IV, Physics Dept., Ga. Inst. of Tech.
HERTZKA, MISS KATHERINE, FI, 846 Briarcliff Rd., N.E.
HIGGINS, GEORGE W., II
HINE, DR. JACK, II, Dept. of Chemistry, Ga. Inst. of Tech.
HINES, DR. MARION, FV, Dept. of Anatomy, Emory University
HOCKING, DR. RICHARD, VI, Philosophy Dept., Emory University
HOFFMAN, OWEN, III, VII, Washington
HOGAN, MRS. R. A., II, IV, Box 115, Alamo
HOOD, DR. MAUDE P., I, Home Economics Dept., Univ. of Ga., Athens
HOWELL, THELMA, FI, Dept. of Biology, Wesleyan College, Macon
HOWEY, DR. JOSEPH M., FIV, Dept. of Physics, Ga. Inst. of Tech.
HUFF, C. W., IV, Dept. of Math., Ala. Poly. Inst., Auburn, Ala.
HUFF, DR. GERALD B., IV, 160 Greenwood Court, Athens
HUGHES, DR. ROBERT M., V, 849 Peachtree St., N.E.
HUMBERT, WILLIAM F., IV, P.O. Box 537, Milledgeville
HUNNICUTT, L. A., I, II, IV, Metter
HUNT, DR. ERNEST L., FI, Dept. of Biology, Emory University
HURST, DR. VERNON J., III, Agric. Bldg., 19 Hunter St. (3)
HUTZLER, LEROY, III, IV, General Elec. Co., Redmond Circle, Rome

INGOLS, DR. R. S., FII, I, Engr. Exp. Sta., Ga. Inst. of Tech.

JACKSON, LAWSON E., JR., III, Box 889, Savannah
JACKSON, DR. L. W. R., FI, 538 Castalia Ave., Athens
JAMES, Dr. W. T., FV, Meigs Hall, Univ. of Ga., Athens
JARNAGIN, M. P., FI, Coll. of Agric., Univ. of Ga., Athens
JEFFRIES, DR. WILLIAM B., I, Medical Coll. of Ga., Augusta
JENKINS, DR. JAMES H., I, School of Forestry, Univ. of Ga., Athens
JOHNSON, HARRY E., II, 758 Wimbish Rd., Macon
JOHNSTONE, FRANCIS E. JR., I, Coll. of Agric., Univ. of Ga., Athens
JONES, DR. E. E., I, 4904 Raymond Dr., Doraville
JONES, DR. HAROLD C., I, 2160 Stewart Ave. (15)
JONES, DR. HERMAN D., II, Box 1456, Atlanta
JONES, MARVIN J., II, 485 Adrian Pl., Macon
JONES, RICHARD N., IV, 2476 East Drive, Decatur
JONES, DR. WILLIAM H., FII, Dept. of Chem., Emory University
JONES, WALLIS L., I, Laboratory, Emory Univ. Hosp., Emory University

KEELER, DR. CLYDE E., FI, Dept. of Biology, G.S.C.W., Milledgeville
KELLY, DR. A. R., III, VI, 1650 Milledge Ave., Athens
KELLY, DR. G. L., FV, 2131 Gardner St., Augusta
KETHLEY, T. W., FI, Ga. Inst. of Tech.
KINNETT, MRS. ISABEL HACKETT, IV, 1752 Hardeman Ave., Macon

KITE, DR. J. H., FV, 142 Doctors Bldg., 490 Peachtree St., N.E. (8)
KNAPP, DR. WM. A., IV, 39 University Court, Athens
KNOX, FRANKLIN E., II, Ga. Coastal Plains Exp. Sta., Tifton
KOLITSCHEW, DR. K. D., IV, Piedmont College, Demorest
KOPF, FRANK A., II, 2020 Ridgewood Dr., N.E. (6)
KOZELNICKY, GEORGE M., I, Dept. of Plant Pathology, Univ. of Ga., Athens
KURTZ, DR. HERMAN F., II, Chemistry Dept., Ga. State Coll. Bus. Ad.

LAGEMANN, DR. R. T., FIV, Dept of Physics, Vanderbilt Univ., Nashville, Tenn.
LAKE, L. E., II, IV, 928 Winona Blvd., Rochester 17, N. Y.
LAMMERS, C. J., I, 125 Wilton Dr., Decatur
LAMMERS, MRS. HELENE N., FI, 125 Wilton Dr., Decatur
LANGHORNE, DR. M. C., FV, Dept. of Psychology, Emory University
LANNI, DR. FRANK, I, Dept. of Bacteriology, Emory University
LAROCCA, DR. JOSEPH P., II, 115 Fortson Circle, Athens
LASSITER, JAMES W., I, 246 Lasiter, Athens
LASSLO, DR. ANDREW, I, II, V, Box 321, Emory University
LEMJAKOV, NIKOLAJ, II, P.O. Box 200, Demorest
LEONARD, SUSAN, I, Bass High School, 737 Woodland Ave., S.E.
LESTER, FRED F., II, 12 Brookland Dr., Cartersville
LESTER, DR. J. G., F, III, Dept. of Geology, Emory University
LIGHT, WOODROW, II, Gordon Military Academy, Barnesville
LIPPS, MISS E. LEWIS, FI, Shorter Coll., Rome
LIPSIUS, S. T., II, 1819 Windemere Dr., N.E.
LIU, DR. FRED W. J., II, 777 Lawrence Ave., East Point
LIU, DR. WEI-CHIN, II, V, 223 Walton St., N.W.
LOCKHART, LUTHER B., II, 186 E. Wesley Rd., N.E.
LOEB, MISS BEVERLY A., I, 1277 Cumberland Rd.
LOVVORN, CYRIL, I, The Dromedary Co., Woodbury
LOWE, MRS. ARTIE B., I, Route 4, Milledgeville
LOWE, JAMES U. JR., II, 211 Elm St., N.W., Washington, D. C.
LUCAS, J. H., IV, Dept. Civil Engin., Ga. Inst. of Tech.
LUND, DR. HORACE O., FI, Entomology, Univ. of Ga., Athens
LUNSFORD, EMORY S., IV, Box 193, Roswell
LUTTRELL, DR. E. S., I, Ga. Exp. Sta., Experiment
LYONS, SANFORD C., II, III, IV, Dry Branch

MACDOUGALL, DR. M. S., FI, Mt. Vernon Apt., 423 Clairmont Ave., Decatur
MAGUIRE, REV. WM. A., II, 335 Ivy St., N.E.
MALEADY, NOEL R., II, IV, General Elec. Co., Rome
MANDELL, DR. LEON, II, Chemistry Dept., Emory University
MARTIN, DR. BERTHA E., I, Dept. of Biology, Shorter Coll., Rome
MARTIN, DR. H. W., FV, Dept. of Psychology, Emory University
MARTIN, MISS LENA, FII, Route 3, LaGrange
MARTIN, PROF. ROMEO J., III, Dept. of Geology, Emory University
MARTINEK, DR. ROBERT G., II, 2260 Nelson Ave., S.E., Grand Rapids 7, Mich.
MASTER, MRS. CLEO S., I, 92 Spring St., St. Augustine, Fla.
MATHER, DR. EUGENE, FIII, Geography Dept., Univ. of Ga., Athens
MATHEY, DR. WM. J. JR., I, 230 Center St., E. Lansing, Mich.
MAY, DR. ORVILLE E., FII, VII, 3449 Peachtree Rd.
McANALLY, S. G., III, IV, 619 N. Gordon Cir., Hapeville
McCALL, STERLING, I, II, Norman Park
McHUGH, STANLEY A., II, Route 1, Barnesville
McKENZIE, DR. JOHN W., V, I, Dept. of Microscopic Anatomy, Med. Coll. of Ga., Augusta
McLOUGHLIN, DR. CHRISTOPHER J., 417 Hillside Dr., N. W.
McMILLAN, DR. D. R., FIV, P. O. Box 764, Emory Univ.

MEALING, DR. H. S., 301 Southern Finance Bldg., Augusta
MEEKS, DR. M. L., IV, 1620 Moores Mill Rd., N. W.
MIDDLETON, MISS CORA D., VII, Wilmington Island
MILEY, MISS BARBARA JEAN, II, Devens Hall 318-4, 20 Plattsburg Ct. N. W., Washington 6, D. C.
MILLER, DR. JAMES A., FI, Anatomy Dept., Emory University
MILLER, DR. JULIAN H., FI, Dept. of Plant Pathology, Univ. of Ga., Athens
MILLER, WILLIAM B., JR., IV, Dept. of Radiology, Woodruff Bldg., Emory University
MILLIKAN, F. FORD, II, School of Pharmacy, Univ. of Ga., Athens
MILLMAN, NATHAN, II, III, 3731 Berkley Dr., Macon
MITCHELL, DR. LANE, F III, Dept. of Ceramics, Ga. Inst. of Tech.
MOONEY, JOHN A., IV, Ga. Inst. Tech.
MOORE, D. C., IV, Emory-at-Oxford, Oxford
MOORE, DR. J. E., FV, 4406 Jett Rd., N. W.
MOORE, MRS. J. N., II, 728 Collier Rd., N.W.
MORRALL, GORDON R., Will Corp., 890 New Chattahoochee Ave., N. W.
MORRIS, COL. J. EDGAR, FII, 2155 Cascade Rd., S. W.
MORRIS, H. D., I, Agronomy Dept., Univ. of Ga., Athens
MORRISON, DR. PAUL G., VI, 4229 Pine Grove Terr., Apt. 3, Brookhaven
MORRISON, SPENCER H., 595, Milledge Cir., Athens
MOSLEY, DR. R. E., II, 1183 Holt Ave., Macon
MOSS, DR. WILLIAM L., F, P. O. Box 231, Athens
MULLER, ROBERT B., II, John J. Harte Co., Box 2192
MUNSTER, DR. RALPH F., VI, Ga. State Coll. Bus. Adm., Ivey St.

NAPIER, A. Y., SR., I, II, Lumber City
NARMORE ,DEAN P. B., IV, Dept. of Eng. Draw. & Mech., Ga. Inst. of Tech.
NEEL, MALCOLM M., JR., VII, Crawford
NELSON, DR. SARA LOUISE, IV, 512 N. Columbia St., Milledgeville
NEVINS, DR. BEATRICE, I, Valdosta State Coll., Valdosta
NEWSOM, E. T., JR., I, III, 302 Clark Drive, Rome
NEWTON, MISS CATHERINE, F, I, II, School of Economics, Univ. of Ga., Athens
NEWTON, MISS JULIE, I, 2388 Armond Rd., N. E.
NIKITIN, DR. A. A., II, P. O. Box 89, College Park
NORWOOD, SAMUEL L., III, II, 900 Roosevelt Hwy., College Park
NUTTYCOMBE, DR. J. W., FI, Dept. of Zoology, Univ. of Ga., Athens

ODUM, DR. EUGENE P., FI, Dept. of Zoology, Univ. of Ga., Athens
O'MARY, DR. CLAYTON C., I, Coll. of Agric., Univ. of Ga., Athens
OMWAKE, PROF. KATHERINE, FV, Agnes Scott Coll., Decatur
ORMSTON, MISS SUE S., II, IV, 1558 Brook Terr., Decatur
ORR, DR. CLYDE JR., II, IV, Eng. Expt. Station, Ga. Inst. Tech.
OSBORNE, DR. R. T. FV, Old College, Univ. of Ga., Athens

PAPAGEORGE, DR. EVANGELINE, FII, V, Woodruff Bldg. Emory Univ.
PAPAS, DR. ARIS T., V, VI, 1447 Peachtree St.
PARIZEK, DR. ELDON J., III, Dept. of Geology, Univ. of K. C., Kansas City, Missouri
PARKER, DR. I. M., 506 Montgomery Ferry Dr., N. E.
PARKER, MISS VIRGINIA, Jordan High School, Columbus
PATTERSON, ARCHIE E., I, School of Forestry, Univ. of Ga., Athens
PATTON, DR. AVERY JR., II, 1518 Superior Ave., Decatur
PAUL, DR. JOSEPH J., I, 151 Hawthorne St., Athens
PAYNE, DR. WILLIAM J., I, Dept. of Bacteriology, Univ. of Ga., Athens
PENNINGTON, TULLY S., I, Box 74, Collegeboro
PERKINS, DR. H. F., FI, Agronomy Dept., Univ. of Ga., Athens
PERLIN, IRWIN E., F IV, VI, 5012 Carol Lane, N. W., (5)
PETERS, HERBERT P., IV, Windy Hill Road, Route 3, Marietta

PEYTON, CAPT. GARLAND, FIII, Mines, Mining and Geol., 19, Hunter St.
PFUETZE, DR. PAUL E., VI, Dept. of Philosophy, Univ. of Ga., Athens
PHILBROOK, DR. GEORGE E., II, Chemistry Dept., Univ. of Ga., Athens
PHILLIPS, DR. H. M., FI
PHILIP, ROBERT H., VII, Rabun Gap-Nagoochee School. Rabun Gap
PICKETT, DR. B. S., FI, 637 Alcoa Rd., Alcoa, Tenn.
PIERCY, DR. PAUL L., I, School of Veterinary Medicine, Athens
PIGG, EWELL G., IV, North Ga. Coll., Dahlonega
PLATT, DR. ROBERT B., FI, Dept. of Biology, Emory University
PLICE, DR. MAX J., I, 1251 Clifton Rd., N. E.
PLYMALE, R. B., IV, Mercer Univ., Macon
POMEROY, DR. LAWRENCE R., I, Sapelo Island
POULOS, NICK E., 1764 Flagler Ave., N. E.
PROCTOR, WILLIAM J., JR., II, III, Southern Clays, Inc., Gordon
PROSSER, DR. EDWARD T., FIV, Dept. of Physics, Ga. Inst. of Tech.
PROVO, MARVIN M., I, Young Harris College, Young Harris
PRUNTY, DR. MERLE C., FIII, Dept. of Geog. & Geol., Univ. of Ga., Athens
PUND, DR. EDGAR R., FV, Dept. of Pathology, Med. Coll. of Ga., Augusta
PURVIS, C. T., IV, School of Math., Ga. Inst. of Tech.

RAGOTZKIE, DR. ROBERT A., I, Marine Biological Station, Sapelo Island
REBUCK, MR. ALLEN, I, Biology Dept., Emory University
REDMOND, DR. W. B., FI, Box 534, Emory University
RICHARDSON, MRS. HELEN C., FI, 38 Peachtree Circle, N. W.
RICHARDSON, MISS KATHRYN, I, VII, 2653 Hill Crest Ave., Macon
ROBERTS, GENE, II, Jarrell-Ash Co., 1430 Boulevard N. E.
ROBERTS, DR. LORIN W., I
ROBESON, DR. ANDREW, IV, Reactor Training Div., Oak Ridge Natl. Labs., Oak Ridge, Tennessee
ROBINSON, DR. HENRY A., FIV, Agnes Scott Coll., Decatur
ROELOFFS, DR. ROBERT, VI, Philosophy Dept., Emory University
ROHRER, DR., R. H., FIV, Dept. of Physics, Emory University
ROSE, HENRY J., II, 702 N. Texas St., Dridder, Louisiana
ROSE, WILLIAM, II, 3360 Mathieson Dr., N.E.
ROYALS, DR. E. EARL, FII, Dept. of Chem., Emory University
RUEGGEBERG, DR. WALTER H. C., Atlas Power Co., Wilmington 99, Del.
RUNKLE, DR. GERALD J., IV, Doane Coll., Crete, Nebraska
RUSSELL, DR. JANE A., I, Dept. of Biochem., Emory University
RUSSELL, WILLIAM J., 303 C St., S. E., Washington, D. C.
RUSSELL, MRS. W. J., 303 C St. S. E., Washington, D. C.
RUSSO, VINCENT J., II, 2289 Headland Dr., East Point

SALYERDS, MISS ANNE M., I, Agnes Scott Coll., Decatur
SANDELL, WESLEY R., IV, 4729 Miller Dr., Chamblee
SANDERS, EUGENE, FI, 1176 Ridgewood Dr., N. E.
SARBACHER, DR. ROBERT I., I, IV, 2424 Massachusetts Ave., Washington 8, D. C.
SAWYER, DR. ELIZABETH L., Piedmont Coll., Demorest
SCHARF, DR. ROBERT, VI, 2197 Willow Ave., N. E., (5)
SCHIFFMAN, CLARENCE D., II, 841 Durant Place, N. E.
SCHLUETER, DONALD P., II
SCHNEBLY, MISS MARTHA E., V, 1183 Briarcliff Rd., N. E.
SCHOENBURN, DR. CLARA H., University of Maryland, College Park, Md.
SCHUMPERT, MISS MARY, 3082 McCurdy Way, Decatur
SCOTT, DR. A. W., FII, Dept. of Chem., Univ. of Ga., Athens
SCOTT, JOHN W. M., II, Southern Clays, Inc., Gordon
SESSIONS, DR. R. F., FII, 595 McAfee St., N. W.
SEVERINGHAUS, NELSON, FIII, Consolidated Quarries, Lithonia
SEWARD, DR. GEORGE C., FVI, Oglethorpe University

SHARP, DR. HENRY JR., IV, 729 Brittain Dr. N. W.
SHATZEN, MAXWELL L., II, 1076 Boulevard N. E.
SHEPEARD, DR. WALTER L., V, Med. Coll. of Ga., Augusta
SHERRIL, MISS ELISE, IV, 300 Church St., LaGrange
SHEURING, DR. JOHN J., 505 Highland Ave., Athens
SHOFFEITT, Paul E., I, 2475 Morosgo Pl., N. E.
SHOVER, MISS ELISE CAROLINE, FII, 138 Ridgeland Way, N. E.
SHOWALTER, ALBERT M., II, 2696 Dodson Dr., East Point
SHUMAN, DR. VILDA, 701 Laurel Street, Waycross
SIKES, DR. DENNIS, I, School of Vet. Medicine, Univ. of Ga., Athens
SIMMONS, J. A., II, III, IV, 308 Cleburne Ave., Marietta
SIMMONS, DR. JAMES W., FIV, Dept. of Physics, Emory University
SIMS, DR. JOHN G., FII, Box 85, Dahlonega
SIMPSON, WILLIAM C., IV, 3261 Lambeth Lane, Doraville
SINGLEY, J. EDWORD, IV, 1718 Cahoon St., S.W.
SIZEMORE, DR. J. J. JR., I, P. O. 95, Waverly Hall
SLACK, S. B., FIV, 455 Clairmont Ave., Decatur
SLEDD, MARVIN B., FIV, P. O. Box 193, Avondale Estates, Ga.
SMITH, MISS ALTHEA, 430 W. Poplar St., Griffin
SMITH, DR. DAVID M., FIV, Dept. of Math., Ga. Inst. of Tech.
SMITH, MRS. SARAH B., P. O. Box 439, Milledgeville
SMITH, MRS. TOM HALL, I, Box 439, Milledgeville
SMITH, MRS. WILLIS, I, 1363 Northview Ave., N. E.
SOUTHWELL, BYRON L., I, Ga. Coastal Plain Exp. Sta., Tifton
SOWERS, GEORGE F., IV, III, 3031 Westminster Cir., N. W. (5)
SPELL, C. RAYMOND, II, 590 Agriculture Dr., Athens
SPICER, DR. W. M., FII, Dept. of Chem., Ga. Inst. of Tech.
SPOONER, J. DEWEY, South Ga. College, Douglas
STACK, MRS. T. G., 42 Park Avenue, Nagatuck, Conn.
STAKELY, MISS LOUISE, FI, 1368 Emory Rd., N. E.
STEELE, DR. JAMES H., 167 Old Ivy Rd., N. E.
STEPHENSON, S. P., JR., 1754 Moores Mill Rd., N. W.
STEWART, WILLIAM, II, Box 4155, (2)
STOKES, DR. JAMES, FI, G.S.C.W., Milledgeville*
STORHERR, R. W., II, Route 1, Box 174, Griffin
STOUGH, DR. B. DOLORES, I, Brenau Coll., Gainesville
STRALEY, DR. H. W., FIII, 1635 W. Wesley Rd., N.W.
STROBEL, MISS PHYLLIS L., 3082 McCurdy Way, Decatur
SWAIN, MISS EMELIZA, V, Guidance Center, Univ. of Ga., Athens
SYDENSTRICKER, DR. VIRGIL P., V, VA Hospital, Forest Hill Div., Augusta
SZEPSENWOL, DR. J., V, Coll. of Medicine, Univ. of N. C., Chapel Hill, N. C.

TANNER, MISS RUBY, VI, 3739 Berkeley Dr., Macon
TAYLOR, DR. JAMES L., FII, 1005 Rosedale Rd., N. E.
TAYLOR, ROBERT E., VII, 1116 Edna Place, Macon
TEBEAU, E. E., II, 100 Atwood Dr., Marietta
THOBURN, DR. ISABELLA, V, 17 Curzon Road, New Delhi, India
THOMPSON, MARK E., IV, Box 24, Alpharetta
THOMPSON, M. T., FIII, U. S. Geol. Survey, 50 7th St., N. E. (5)
THOMPSON, WILLIAM K., III, 2234 Lorraine Ct., Savannah
TIFFANY, DR. E. J., I, 1339 Clairmont Circle, Decatur
TILGHMAN, MISS ELISE, VII, 474 Pinetree Dr., N. E.
TOOTLE, MARTHA L., Route 1, Manassas
TORPIN, DR. RICHARD, F V, Med. Coll. of Ga., Augusta
TRAWICK, MISS JESSIE, FII, Dept. of Chem., G.S.C.W., Milledgeville

UHL, H. C., III, 1063 E. Clifton Rd., N. E.

VANESSELTINE, DA. WILLIAM P., I, School of Vet. Med., Univ. of Ga., Athens
VARNADOE, ASHTON, IV, 6201 LaRoche Ave., Savannah

*Deceased.

VAUGHN, JOSEPH A., II, IV, 2781 Memorial Dr. S. E. (17)
VAUGHN, W. HARRY, III, 4661 Rivoli Drive, Macon
VEATCH, MISS O'NEAL, I, Coker's Hosp., Canton
VENARD, HASKELL, FI, 3959 N. Stratford Rd., N. E.
VINCENT, DR. JOSEPH F., FII, G.S.C.W., Milledgeville
VOGEL, DR. RALPH A., I, 4637 Bagley Dr., Chamblee
VOIGHT, C. A., c/o A. S. Aloe Co., Chamblee

WACHTER, REV. ALOYSIUS, II, Dept. of Chem., Benadictine School, Savannah
WADDLE, DR. H. M., FII, West Point
WAGGONER, W. H. JR., II, 160 University Dr., Athens
WAHAB, DR. JAMES H., IV, 3618 McAfee Rd., Decatur
WAITS, CHARLES, II, Will Corp. of Ga., New Chattahoochee Ave.
WALDOCK, DR. KENETH T., II
WALKER, DR. ALMA TOEVS, I, 342 Florida Ave., Athens
WALTER, KENNETH G., II, 932 Plymouth Rd., N. E.
WAMMOCK, DR. HOPE, Fox Spring Rd., Augusta
WARD, WM. E., I, West Ga. Coll., Carrollton
WARD, MRS. DOROTHY M., I, 4114 Caldwell Rd., (19)
WARE, GRAYDON L., I, Dept. of Biology, Mercer Univ., Macon
WARREN, JOHN R., I, II, 2566 Leafmore Dr., Decatur
WATERS, DR. KENNETH L., II, School of Pharmacy, Univ. of Ga., Athens
WEBER, DR. PAUL, FII, Ga. Inst. of Tech.
WEEKS, DR. LEO, I, Biology Dept., Berry Coll., Mt. Berry
WELLS, BERT H., II, I, The Coca Cola Co.
WESTFALL, DR. J. J., VI, Dept. of Botany, Univ. of Ga., Athens
WETHERINGTON, ROGER D., IV, 3248 E. Harrington Dr., Decatur
WHITE, A. O. JR., IV, 1535 Howell Mill Road, N. W. (18)
WHITE, DR. GOODRICH C., FV, 2075 Fairwood Lane, N. E. (6)
WHITEHEAD, DR. T. H., FII, Dept. of Chem., Univ. of Ga., Athens
WHITLEY, DR. W. C., FII, Dept. of Chem., Ga. Inst. of Tech.
WICHT, MARION C., IV, P. O. Box 343, Dahlonega
WILDMAN, ROBERT W., V, Milledgeville State Hosp., Milledgeville
WILEY, M. C., II, Emory-at-Oxford, Oxford
WILHELMI, DR. ALFRED E., I, II, Dept. of Biochem., Emory University
WILLIAMS, ALEXANDER, I, II, 1260 Roxboro Dr., N. E.
WILLIAMSON, MRS. DOUGLAS, I, Dept. of Biology, Oglethorpe University
WILSON, DR. CHARLES C., I, 177 Milledge Terr., Athens
WINGO, EARL W., III, V. 1071 Briarcliff Rd., N. E.
WITHAM, DR. A. CALHOUN, I, Med. Coll. of Ga., Augusta
WOHLFORD, J. G., IV, 616 Williams St., N. W.
WOOD, DR. R. HUGH, V, VI, Woodruff Memorial Bldg., Emory University
WOODROOF, DR. JASPER G., FI, Ga. Exp. Sta., Experiment
WOODWARD, LEROY A., IV, 508 Lakeshore Dr., N. E., (6)
WOOLF, WM. E., IV, 142 Avery St., Decatur
WORSHAM, DR. WILLIAM A., II, 440 Highland Ave., Athens
WROTH, DR. BENJAMIN B., FII, Dept. of Chem., Inst. of Tech.
WYATT, WILLIAM C. JR., VII, 200 Eastman Ave., Eastman
WYCOFF, DR. H. A., FI, Dept. of Public Health, Ga. Inst. Tech.
WYNN, WINFREY, V, Basic Science Bldg., Emory University

YORK, GUY A., IV, 745 House Rd.
YOUNG, DR. FLORENE, FV, Dept. of Psychology, Univ. of Ga., Athens
YOUSE, BEVAN K., IV, Dept. of Math., Emory University

ZACHERT, MRS. E. G., II, 1760 Harbin Rd., S. W.
ZIEGLER, DR. W. T., FII, 220 W. Virginia Ave., College Park
ZILLIG, MISS LOUISE D., I, Biology Dept. Wesleyan Coll., Macon
ZSUFFA, LESLIE F., IV, 55 Muscogee Ave., N. W.

In order to conserve space the name of the state, GEORGIA, has been omitted. Where no post office is given ATLANTA is to be understood. Emory University and Oglethorpe University are post office addresses. Postal zones in ( ).

CALENDAR OF EVENTS FOR 1957-58

October 16.	Meeting of Section Chairmen and Councilors to Plan program for Annual Meeting. 8:00 p.m. Biology Bldg. Emory University.
October 23.	Fall Meeting of Council. 8:00 P.M. Biology Bldg. Emory University.
January 6.	Section Chairmen issue call to their members for papers to be presented at Annual Meeting.
January 22.	Winter Meeting of Council. 8:00 P.M. Biology Bldg. Emory University.
March 1.	DEADLINE for submission of Titles and Abstracts of papers for the Annual Meeting.
April 15.	DEADLINE for receipt of Ballots at office of the Secretary, and for submission of VITAE of persons to be nominated as Fellows in the Academy.
April 16.	Spring Meeting of Council. 8:00 P.M. Biology Bldg. Emory University.
April 17-19	State Science Fair and Georgia Junior Academy of Science. University of Georgia, Athens.
April 25-26	Annual Meeting of Academy. Emory University.